Muthurangam Government Arts College (Autonomous),

Vellore-632 002

SYLLABUS FOR THE COURSES

MUTHURANGAM GOVERNMENT ARTS COLLEGE

(AUTONOMOUS)

VELLORE – 632 002

BACHELOR OF ARTS

B.A. TAMIL.

Syllabus

DEGREE COURSE

CBCS PATTERN

(With effect from 2017 - 2018)

Muthurangam Government Arts College (Autonomous), Vellore – 2.

BACHELOR OF ARTS

B.A. TAMIL

DEGREE COURSE

CBSC PATTERN

(With effect from 2017-2018))

The Course of Study and the Scheme of Examinations semester - I

S. No	Part	Study Components / Course Title		Ins. hrs / week	Credit	Title of the Paper / Subject Code		Maximum Marks		
								CIA	ESE	Total
SEMESTER I								CIA	ESE	Total
1	I	Language	Paper-1	6	3	தமிழ்/பிறமொழிகள்.	17U1FT1	25	75	100
2	II	English	Paper-1	6	3	ஆங்கிலம்.	17U1FE1	25	75	100
3	III	Core Theory	Paper-1	5	4	இக்கால இலக்கியம். (கவிதை, உரைநடை)	17U1TA1	25	75	100
4	III	Core Theory	Paper-2	5	4	இலக்கணம் -1. நன்னூல். (எழுத்ததிகாரம்)	17U1TA2	25	75	100
5	III	ALLIED -1	Paper-1	6	5	தமிழக வரலாறும் பண்பாடும்.	17U1ATA1	25	75	100
6	IV	Environ. Studies		2	2	சுற்று சூழல் கல்வி.	17U1ENV	25	75	100
				30	21			150	450	600
SEMESTER II								CIA	ESE	Total
7	I	Language	Paper-2	6	3	தமிழ்/பிறமொழிகள்	17U2FT2	25	75	100
8	II	English	Paper-2	4	2	ஆங்கிலம்	17U2FE2	25	75	100
9	III	Core Theory	Paper-3	5	4	இக்கால இலக்கியம் (கவிதை, உரைநடை, நாடகம், புதினம், சிறுகதை)	17U2TA3	25	75	100
10	III	Core Theory	Paper-4	5	4	இலக்கணம் 2 நன்னூல் (சொல்லதிகாரம்)	17U2TA4	25	75	100
11	III	ALLIED-1	Paper-2	6	5	தமிழக வரலாறும் பண்பாடும் 2	17U2ATA2	25	75	100
12	IV	Value Education		2	2	மதிப்புக் கல்விப்பாடம்	17U2VE	25	75	100
13	IV	Soft Skill		2	1	Soft Skill	17U2SS	40	60	100
				30	21			190	510	700

S. No	Part	Study Components / Course Title		Ins. hrs / week	Credit	Title of the Paper / Subject Code		Maximum Marks		
								CIA	ESE	Total
SEMESTER III								CIA	ESE	Total
14	I	Language	Paper-3	6	3	தமிழ் / பிறமொழிகள்.	17U3FT3	25	75	100
15	II	English	Paper-3	6	3	ஆங்கிலம்.	17U3FE3	25	75	100
16	III	Core Theory	Paper-5	4	4	இலக்கியம் -3 சமயப்பாடல்களும் சிற்றிலக்கியங்களும்.	17U3TA5	25	75	100
17	III	Core Theory	Paper-6	3	3	இலக்கணம் -3 யாப்பருங்கலக்காரிகை.	17U3TA6	25	75	100
18	III	ALLIED-2	Paper-3	6	5	தமிழ் இலக்கிய வரலாறு -1.	17U3ATA3	25	75	100
19	IV	Skill based Subject	Paper-1	3	3	பயன்பாட்டுத் தமிழ்	17U3TASB	25	75	100
20	IV	Non-major elective	Paper-1	2	2	தமிழ் மொழி – அறிமுகம்.	17U3TANM	25	75	100
				30	**23**			**175**	**525**	**700**
SEMESTER IV								CIA	ESE	Total
21	I	Language	Paper-4	6	3	தமிழ்/பிறமொழிகள்.	17U4FT4	25	75	100
22	II	English	Paper-4	6	3	ஆங்கிலம்.	17U4FE4	25	75	100
23	III	Core Theory	Paper-7	4	4	இலக்கியம் -4 காப்பியங்கள்	17U4TA7	25	75	100
24	III	Core Theory	Paper-8	3	3	இலக்கணம் -4 தண்டியலங்காரம். (பொருளணியியல் மட்டும்)	17U4TA8	25	75	100
25	III	ALLIED-2	Paper-4	6	5	தமிழ் இலக்கிய வரலாறு -2.	17U4ATA4	25	75	100
26	IV	Skill based Subject	Paper-2	3	3	படைப்பிலக்கியமும் மொழிபெயர்ப்பும்.	17U4TASB	25	75	100
27	IV	Non-major elective	Paper-2	2	2	தமிழ்ப் பண்பாடு - அறிமுகம்.	17U4TANM	25	75	100
				30	**23**			**175**	**525**	**700**

S. No	Part	Study Components / Course Title		Ins. hrs / week	Credit	Title of the Paper / Subject Code		Maximum Marks		
								CIA	ESE	Total
SEMESTER V								CIA	ESE	Total
28	III	Core Theory	Paper-9	5	5	சங்க இலக்கியம். (புறம்)	17U5TA9	25	75	100
29	III	Core Theory	Paper-10	6	5	இலக்கணம் -5 புறப்பொருள் வெண்பா மாலை.	17U5TA10	25	75	100
30	III	Core Theory	Paper-11	6	4	தமிழ்மொழி வரலாறு.	17U5TA11	25	75	100
31	III	Core Theory	Paper-12	6	4	இலக்கியத்திறனாய்வு.	17U5TA12	25	75	100
32	III	Elective	Paper-1	4	4	(கீழ்கண்ட மூன்றில் ஏதேனும் ஒன்றை தெரிவு செய்துக் கொள்ளலாம்) அ. இணையம். ஆ. நாட்டுப்புறவியல்✓ இ. விளம்பரவியல்.	17U5TAE1	25	75	100
33	IV	Skill based Subject	Paper-3	3	3	கல்வெட்டியல்.	17U5TASB	25	75	100
				30	25			150	450	600
SEMESTER VI								CIA	ESE	Total
34	III	Core Theory	Paper-13	5	5	சங்க இலக்கியம் (அகம்).	17U6TA13	25	75	100
35	III	Core Theory	Paper-14	6	5	இலக்கணம் -6 நம்பியகப் பொருள்.	17U6TA14	25	75	100
36	III	Core Theory	Paper-15	6	5	திராவிட மொழிகளின் ஒப்பிலக்கணம்.	17U6TA15	25	75	100
37	III	Elective	Paper-2	5	4	(கீழ்கண்ட மூன்றில் ஏதேனும் ஒன்றை தெரிவு செய்துக் கொள்ளலாம்) அ. இதழியல் ✓ ஆ. புத்தக பதிப்பியல். இ. தமிழகம் - ஊர், பெயர் வரலாறு.	17U6TAE2	25	75	100
38	III	Elective	Paper-3	5	4	(கீழ்கண்ட மூன்றில் ஏதேனும் ஒன்றை தெரிவு செய்துக் கொள்ளலாம்) அ. தமிழர் அழகுக் கலைகள். ஆ. பெண்ணியம். (அறிமுகம்)✓ இ. சுற்றுலாவியல்.	17U6TAE3	25	75	100
39	IV	Skill based Subject	Paper-4	3	3	தகவல் தொடர்பியல்.	17U6TASB	25	75	100
40	V	Extension Activities		-	1			50	-	50
				30	27			200	450	650

B.A. –TAMIL. TOTAL CREDITS

Part	Subject	Papers	Credit	Total credits	Marks	Total Marks
Part I	Languages.	4	3	12	100	400
Part II	English.	4	(2-3)	11	100	400
Part III	Allied (Odd Semester).	2	5	10	100	200
	Allied (Even Semester).	2	5	10	100	200
	Electives.	3	4	12	100	300
	Core.	15	(3-7)	63	100	1500
Part IV	Environmental Studies.	1	2	2	100	100
	Soft skill.	1	1	1	100	100
	Value Education.	1	2	2	100	100
	Lang. & Others/NME.	2	2	4	100	200
	Skill Based.	4	3	12	100	400
Part V	Extension.	1	1	1	50	50
	Total	**40**		**140**		**3950**

முத்துரங்கம் அரசினர் கலைக் கல்லூரி

இளங்கலைப் பட்டப்படிப்பு

தமிழ்

2017-2018ஆம் கல்வியாண்டு முதல் நடைமுறைப்படுத்தப்படும்

பாடத்திட்டம் (CBCS)

B.A. Tamil Syllabus (CBCS)

முதலாம் ஆண்டு

முதல் பருவம்

சிறப்புப் பாடம்

தாள் - 1

இலக்கியம் - 1

17U1TA1 இக்கால இலக்கியம் - 1
(கவிதை, உரைநடை)

கவிதை :

அலகு -1   பாரதிதாசன்   - புரட்சிக் கவி.

அலகு -2   கவிஞர் கண்ணதாசன்   - தைப்பாவை.

அலகு -3   கவிக்கோ அப்துல் ரகுமான் - விதைப் போல் விழுந்தவன்.

(அறிஞர் அண்ணா பற்றிய கவிதைகள்)

உரைநடை :

அலகு -4   திரு.வி.க.   - பெண்ணின் பெருமை.

அலகு -5   மு.வரதராசனர்   - நல்வாழ்வு.

தாள் - 2

இலக்கணம் - 1.

17U1TA2 நன்னூல் - எழுத்ததிகாரம்.

பாடநூல்   :   **நன்னூல் - எழுத்ததிகாரம்,**
காண்டிகை உரை – ஆறுமுக நாவலர்.

அலகு 1   :   பாயிரம்.

அலகு 2   :   எழுத்தியல்.

அலகு 3   :   பதவியல்.

அலகு 4   :   உயிரீற்றுப் புணரியல்.

அலகு 5   :   மெய்யீற்றுப் புணரியல், உருபு புணரியல்.

சார்புப்பாடம் - 1

தாள் - 1

17U1ATA1 தமிழக வரலாறும் பண்பாடும் - 1.

பாடநூல்   :   கே.கே.பிள்ளை - தமிழக வரலாறு மக்களும் பண்பாடும்,
உலகத் தமிழாராய்ச்சி நிறுவனம்,
தரமணி, சென்னை -113.

அலகு 1   :   தமிழக வரலாற்றுக்கான அடிப்படை ஆதாரங்கள், தமிழகத்தின்
.   இயற்கை அமைப்புகள் - வரலாற்றுக் காலத்திற்கு முந்தைய
.   தமிழகம்.

அலகு 2   :   சிந்து வெளி அகழ்வாராய்ச்சி — பண்டைய தமிழரின் அயல்
.   நாட்டுத் தொடர்புகள்.

அலகு 3   :   தமிழ் வளர்த்த சங்கம் - சங்க இலக்கியம் - பண்டையத்
.   தமிழரின் வாழ்க்கை.

அலகு 4   :   களப்பிரர்கள் - பல்லவர்கள்.

அலகு 5   :   தமிழகத்தில் நான்காம் நூற்றாண்டு முதல் ஒன்பதாம் நூற்றாண்டு
.   வரையில் சமூக நிலை.

பார்வை நூல்கள் : ஞா. தேவநேயப் பாவாணர் - பண்டைத் தமிழர் நாகரிகமும்.

வையாபுரிப் பிள்ளை — தமிழர்ப் பண்பாடு.

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MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS) VELLORE 2

17U1ENV - PART-IV ENVIRONMENTAL STUDIES.

SYLLABUS

(For all UG Degree Courses)

(with effect from 2017-2018)

SEMESTER I

UNIT-1: INTRODUCTION TO ENVIRONMENTAL SCIENCES: NATURAL RESOURCES :

Environmental Sciences - Relevance - Significance - Public awareness - Forest resources - Water resources - Mineral resources - Food resources - conflicts over resource sharing -Exploitation - Land use pattern - Environmental impact - fertilizer - Pesticide Problems -case studies.

UNIT-H: ECOSYSTEM, BIODIVERSITY AND ITS CONSERVATION:

Ecosystem - concept - structure and function - producers, consumers and decomposers -Food chain - Food web - Ecological pyramids - Energy flow - Forest, Grassland, desert and aquatic ecosystem.

Biodiversity - Definition - genetic, species and ecosystem diversity - Values and uses of biodiversity - biodiversity at global, national (India) and local levels - Hotspots, threats to biodiversity - conservation of biodiversity - Insitu &. Exsitu.

UNIT-111: ENVIRONMENTAL POLLUTION AND MANAGEMENT

Environmental Pollution - Causes-- Effects and control measures of Air, Water, Marine, soil, solid waste, Thermal, Nuclear pollution and Disaster Management - Floods, Earth quake, Cyclone and Land slides. Role of individuals in prevention of pollution - pollution case studies.

UNIT-IV: SOCIAL ISSUES - HUMAN POPULATION

Urban issues - Energy - water conservation - Environmental Ethics - Global warming -Resettlement and Rehabilitation issues - Environmental legislations - Environmental production Act. 1986 - Air, Water, Wildlife and forest conservation Act - Population growth and Explosion - Human rights and Value Education - Environmental Health - HIV/AIDS -Role of IT in Environment and Human Health - Women and child welfare - Public awareness - Case studies.

UN1T-V: FIELD WORK

Visit to a local area / local polluted site / local simple ecosystem - Report submission

REFERENCES

1. KUMARASAMY, K., A. ALAGAPPA MOSES AND M. VASANTHY, 2004. ENVIRONMENTAL STUDIES, BHARATHIDSAN UNIVERSITY PUB, 1, TRICHY

2. RAJAMANNAR, 2004, ENVIRONEMNTAL STUDIES, EVR COLLEGE PUB, TRICHY

3. KALAVATHY,S. (ED.) 2004, ENVIRONMENTAL STUDIES, BISHOP HEBER COLLEGE PUB., TRICHY

முதல் ஆண்டு

இரண்டாம் பருவம்

சிறப்புப் பாடம்

தாள் - 3

இலக்கியம் - 2

17U2TA3 - இக்கால இலக்கியம் - 2.

(நாடகம், புதினம், சிறுகதை)

அலகு - 1 அறிஞர் அண்ணா – நீதி தேவன் மயக்கம் (நாடகம்)

அலகு - 2 'சிந்தனைச் சிற்பி' சிங்காரவேலர் வாழ்வியல்.

அலகு - 3 ரா.பி. சேதுப்பிள்ளை – தமிழ் விருந்து.

அலகு - 4 மு. வரதராசனார் - அகல் விளக்கு (நாவல்).

அலகு - 5 ஜெயகாந்தன் - யாருக்காக அழுதான் ? (சிறுகதை).

பார்வை நூல் - முனைவர் மு.கோவிந்தராசன் - தற்கால இலக்கியங்கள்.

முத்தமிழ் பதிப்பகம், சென்னை.

தாள் - 4

இலக்கணம் - 2

17U2TA4 - நன்னூல் - சொல்லதிகாரம்.

பாடநூல்   :   நன்னூல் - சொல்லதிகாரம்.
                                    காண்டிகை உரை - ஆறுமுக நாவலர்.

அலகு - 1   :   பெயரியல்.

அலகு - 2   :   வினையியல்.

அலகு - 3   :   பொதுவியல்.

அலகு - 4   :   இடையியல்.

அலகு - 5   :   உரியியல்.

சார்புப்பாடம் - 1

தாள் - 2

17U2ATA2 - தமிழக வரலாறும் பண்பாடும் - 2

பாடநூல்   :   **கே.கே.பிள்ளை - தமிழக வரலாறு மக்களும் பண்பாடும்,**
                              உலகத் தமிழாராய்ச்சி நிறுவனம்,
                              தரமணி, சென்னை -113.

அலகு 1   :   சோழப் பேரரசின் தோற்றம் - வளர்ச்சியும் வீழ்ச்சியும்.

அலகு 2   :   சோழர் காலத்தில் தமிழரின் சமுதாயம்.

அலகு 3   :   பாண்டியரின் ஏற்றமும் - வீழ்ச்சியும் - மதுரை நாயக்கர்கள்
                              தமிழகத்தில் 13 ஆம் நூற்றாண்டு முதல் 18 ஆம் நூற்றாண்டு
                              வரையில் சமுக நிலை.

அலகு 4   :   ஐரோப்பியரின் வரவு - 19 ஆம் நூற்றாண்டின் அரசியலும்
                              தமிழகத்தின் சமூக நிலை.

அலகு 5   :   இருபதாம் நூற்றாண்டில் தமிழகம்.

பார்வை நூல் : ஞா. தேவநேயப் பாவாணர், பண்டைத் தமிழ் நாகரிகமும் பண்பாடும்.

வையாபுரிப் பிள்ளை – தமிழர் பண்பாடு.

MUTHURANGAM GOVT ARTS COLLEGE (AUTONOMOUS)

VELLORE 2

17U2VE - VALUE EDUCATION.

Unit i

Value Education - Definition-Relevance to present day-Concept of Human Values-Self introspection-Self esteem.

Unit ii

Family values -Componens .structure and responsibilities of family -Neutralisation of anger - Adjustability -Threats of family life -Status of women in family and society-Caring for needy and elderly -Time allotment for sharing ideas and concerns..

Unit iii

Ethical values - Propessinal ethics -Mass media ethics -Advertising ethics -Influence of ethics on family life -Psychology of chilidren and youth - Leadership qualities -Personality development.

Unit iv

Social values -Faith, service and secularism -Social sense commitment-Students and politics -Social awareness, Consumer awareness Consumer rights and responsibilities -Redressal mechanisms.

Unit v

Efffect of International affairs on values of life .Issue of Globalisation-Modern warfare - -Terrorism . Environmental issues -Mutual respect of different cultures, religions and their beliefs.

BOOK FOR REFERENCE:

1.   T. Anchukandam and J. Kuttianimathathil (Ed) Grow Free Live Free. Krisitu jyoti Publications, Bangalore (1995)

2.   Mani Jacob (Ed) Resource Book for Value Education, Institute for Value Education, New Delhi 2002.

3.   NCERT, SCERT Dharma Bharti National Institute of peace and Value education DBNl, Secunerabad, 2002

4.   A. Daniel and Selvamony -Value education Today, (Madras Charistian College, Tambaram and ALACHE. New Delhi, 1990)

S.   S. Lgnacimuthu -Values for Life - Bettar Youerself Books, Mumbai, 1991.

6.   M.M.M. Mascaronhas Centre for Research Education Science and Training for Family Life Promotion - Family Life Education, Bangalore, 1993

இரண்டாம் ஆண்டு

மூன்றாம் பருவம்

சிறப்புப்பாடம் தாள் - 5

17U3TA5 - இலக்கியம் 3 - சமயப்பாடல்களும் சிற்றிலக்கியங்களும்.

அலகு 1 சுந்தரர் - "பித்தா பிறைசூடி" என்று தொடங்கும் பதிகம்.

திருநாவுக்கரசர் - 'அப்பன் நீ அம்மை நீ' என்று தொடங்கும் பதிகம்.

மாணிக்கவாசகர் - திருச்சதகம் 1 முதல் 20 பாடல்கள் வரை.

அலகு 2 திருமங்கையாழ்வார் - திருக்குறுந்தாண்டம்.

ஆண்டாள் - 'வாரணம் ஆயிரம்' 'கற்பூரம் நாறுமோ' – பாசுரங்கள்.

அலகு 3 மீனாட்சியம்மை

பிள்ளைத் தமிழ் - "வருகைப் பருவம்"

அலகு 4 தமிழ்விடுதூது - (1 - 53 கண்ணிகள்.)

அலகு 5 குற்றாலக் குறவஞ்சி - முழுமையும்.

தாள் - 6

17U3TA6 - இலக்கணம் - 3

பாடநூல்   :   யாப்பருங்கலக்காரிகை.

அலகு 1   :   உறுப்பியல் - எழுத்து, அசை, சீர்.

அலகு 2   :   உறுப்பியல் - தளை, அடி, தொடை.

அலகு 3   :   செய்யுளியல் - வெண்பா, ஆசிரியப்பா.

அலகு 4   :   செய்யுளியல் - கலிப்பா, வஞ்சிப்பா, மருட்பா.

அலகு 5   :   ஒழிபியல்.

சார்புப்பாடம் - 2

தாள் -3

17U3ATA3 - தமிழ் இலக்கிய வரலாறு.

பாடநூல் : முனைவர் கா. வாசுதேவன்
பன்முக நோக்கில் தமிழ் இலக்கிய வரலாறு
தேவன் பதிப்பகம், 16/43, திருநகர், திருவானைக் கோயில்,
திருச்சிராப்பள்ளி - 620 005.
போன் : 0431 – 2230095.

அலகு 1 : தமிழின் தொன்மையும் முத்தமிழ்ச்சிறப்பும் - சங்கமும் தமிழும் -
அகத்தியரும் அகத்தியமும் - முதல் நூல் தொல்காப்பியம் -
எட்டுத்தொகை நூல்கள்.

அலகு 2 : பத்துப்பாட்டு நூல்கள் - சங்க இலக்கியத்தின் மாண்புகள் -
முத்தொள்ளாயிரம் - தமிழில் நீதி நூல்கள்.

அலகு 3 : தமிழில் காப்பியங்களும் புராணங்களும் - இரட்டைக்
காப்பியங்கள் - பெயர்ப்பொருத்தம் - தமிழில் இலக்கண
நூல்களின் எழுச்சி.

அலகு 4 : சமணம் வளர்த்த தமிழ் - பௌத்தம் வளர்த்த தமிழ் - சைவம்
வளர்த்த தமிழ் - வைணவம் வளர்த்த தமிழ்.

அலகு 5 : சித்தர்களின் பங்களிப்பு - தமிழில் சிற்றிலக்கியங்கள் -
உரையாசிரியர்கள் - பிற்காலப் புலவர்கள்.

பார்வை நூல்கள் :

முனைவர். திருமதி. அ. ஜெயம் & திருமதி. சந்திரலேகா வைத்தியநாதன்
தமிழ் இலக்கிய வரலாறு.
ஜனகா பதிப்பகம், 63, தம்பையா சாலை,
மேற்கு மாம்பலம், சென்னை - 600 003.

எம்,ஆர். அடைக்கலசாமி - தமிழ் இலக்கிய வரலாறு
பால்நிலா பதிப்பகம், லயோலா நகர், சென்னை - 600 0024.

சி. பாலசுப்பிரமணியன் - தமிழ் இலக்கிய வரலாறு
பாரி நிலையம், 184, பிராட்வே, சென்னை - 600 108.

திறன் அடிப்படையிலான விருப்பப்பாடம் - 1

தாள் 1

17U3TASB - பயன்பாட்டுத் தமிழ்.

பாடநூல் : கா. பட்டாபிராமன் - மொழிப்பயன்பாடு.
நியூ செஞ்சுரி புக் ஹவுஸ் (பி) லிட்
41, பி. சிட்கோ இன்ஸ்டரியல் எஸ்டேட், அம்பத்தூர்.

அலகு 1 : ஆசிரியர் கடிதம்.

அலகு 2 : அலுவலகம் கடிதம்.

அலகு 3 : விளம்பரத் தமிழ், பதிப்பாசிரியர்.

அலகு 4 : மெய்ப்புத் திருத்தலும் நூலாக்கப் பணியும்.

அலகு 5 : வானொலி, தொலைக்காட்சி நிகழ்ச்சிகளில் பங்குபெறல்,
ஆவணங்கள் வரைதல்.

துறை சாரா விருப்பப் பாடம் - 1

தாள் - 1

17U3TANM - தமிழ் மொழி அறிமுகம்.

அலகு - 1   மொழிக் குடும்பங்கள்.

திராவிட மொழிக் குடும்பம் - திருந்திய மொழி - திருந்தா மொழிகள் - தென் - நடு - வட - திராவிட மொழிகள் - தமிழின் இடம்.

அலகு - 2   தமிழின் தொன்மை.

தொன்மைச் சிறப்பு - மூலமொழியின் தன்மை - தலைமைச் சிறப்பு - செவ்வியல் மொழி - நவீன மொழி - பேச்சு வழக்கு - இலக்கியப் படைப்பு - உயர்தனிச் செம்மொழி - தமிழ் வழங்கும் இடங்கள்.

அலகு - 3   இலக்கண வளமும் பிற வளங்களும்.

இலக்கண வளம் - ஒலியியல் ஒழுங்கு - நிகண்டுகள் - அகராதிகள் - வரலாற்று மூலங்கள் - கடல் கோள்களின் காலம் - தொல்காப்பியத்தின் காலம்.

அலகு - 4   பிற நாட்டுத் தொடர்புகள்.

பிற நாடுகளில் ஆட்சி மொழியாக விளங்கும் நிலை - சப்பான் போன்ற பிற மொழிகளோடு உள்ள தொடர்புகள் - தமிழின் பிற சிறப்புகள்.

அலகு - 5   வேற்றுமொழி படையெடுப்புக்கு ஈடு கொடுக்கும் திறம்.

வாழ்வியலின் கூறுகள் - மணிப்பிரவாள நடை - மன நலமும் இன நலமும் - தமிழில் புகுந்த வேற்றுமொழிச் சொற்கள் - அயல்மொழி படையெடுப்பால் விளையும் தீமைகள்.

பாடநூல்   :   தமிழ்மொழி, இலக்கியம், பண்பாடு - அறிமுகம்
                          சென்னைப் பல்கலைக்கழக வெளியீடு

பாடப் பகுதி :   மொழி மட்டும்.

இரண்டாம் ஆண்டு

நான்காம் பருவம்

சிறப்புப்பாடம்

தாள் - 7

17U4TA7 -இலக்கியம் 4 - காப்பியங்கள்

அலகு 1   :   சிலப்பதிகாரம் - புகார்க் காண்டம்.

1)   அரங்கேற்றுக் காதை.

2)   மனையறம்படுத்த காதை.

அலகு 2   :   மணிமேகலை – மலர்வனம் புக்க காதை.

அலகு 3   :   பெரியபுராணம் - மெய்ப்பொருள் நாயனார் புராணம்

அலகு 4   :   கம்பராமாயணம் - ஊர்த்தேடுப் படலம்.

அலகு 5   :   இரட்சணிய யாத்திரிகம் - சிலுவைப் பாடு.

சீறாப்புராணம் - நகர்ப்படலம்.

தாள் - 8

இலக்கணம் - 4

17U4TA8 - தண்டியலங்காரம்.

பாடநூல் : தண்டியலங்காரம் - பொருளணியியல் மட்டும்.

அலகு 1 : தன்மையணி மற்றும் உவமை அணி (182 அணிகள்).

அலகு 2 : உருவக அணி முதல் முன்னவிலக்கணி முடிய (3 - 6 அணிகள்).

அலகு 3 : வேற்றுப்பொருள் வைப்பணி முதல் தற்குறிப் பேற்ற அணி முடிய (7 - 12 அணிகள்).

அலகு 4 : ஏது அணி முதல் அவநுதி அணி முடிய (13 - 23 அணிகள்).

அலகு 5 : சிலேடையணி முதல் பாவிக அணி முடிய (24-35 அணிகள்).

சார்புப்பாடம் - 2

தாள் - 4

17U4ATA4 - தமிழ் இலக்கிய வரலாறு - 2

பாடநூல் : முனைவர் கா. வாசுதேவன், பன்முக நோக்கில் தமிழ் இலக்கிய வரலாறு
.

அலகு 1 : கிறித்துவர்களின் இலக்கியப்பணி, இசுலாமியர்களின் இலக்கியப் பணி, உரைநடைத் தமிழ்.

அலகு 2 : கவிதை வளம் - இசைத்தமிழ் - நாடகத்தமிழ் - தமிழில் சிறுகதை.

அலகு 3 : தமிழில் புதினம் - தமிழில் புதுக்கவிதை - தமிழில் ஐக்கூ - சென்ரியுவ் - குக்கூ - இலக்கிய இயக்கங்கள்.

அலகு 4 : தமிழில் பிற துறைகள் - கடித இலக்கியம் முதல் - இணையமும் தமிழும் வரை (பக்.351 முதல் பக்.382 வரை).

அலகு 5 : தமிழில் பிற துறைகள் - தொல்லியலும் கல்வெட்டும் முதல் - மீள்பார்வை அட்டவணைகள் வரை (பக்.383 முதல் பக்.433வரை).

திறன் அடிப்படையிலான விருப்பப்பாடம் - 2

தாள் - 2

17U4TASB - படைப்பிலக்கியமும் மொழி பெயர்ப்பும்.

அலகு 1	:	மரபுக்கவிதை	- வெண்பா அல்லது ஆசிரியப்பா.
அலகு 2	:	புதுக்கவிதை	- 20 அடிகள்.
அலகு 3	:	சிறுகதை	- குறிப்பிட்ட பொருளில் மூன்று பக்கங்களில் அமைதல்.
அலகு 4	:	ஓரங்க நாடகம்	- கொடுக்கப்படும் தலைப்பை ஒட்டி நான்கு அல்லது ஐந்து பக்கங்களில் அமைதல்.
அலகு 5	:	மொழிபெயர்ப்பு	- 100 சொற்கள் அடங்கிய ஆங்கிலப் பகுதியைத் தமிழில் மொழிபெயர்த்தல்.

(பொதுவாக மரபுக்கவிதை, புதுக்கவிதை, சிறுகதை, ஓரங்க நாடகம் இவற்றின் இலக்கணம் - அமைப்பு - பாடுபொருள் போன்றவற்றைக் கற்பித்து அதன் பிறகு படைப்புகளுக்கான பயிற்சி அளித்தல் வேண்டும். மொழிபெயர்ப்பின் நுட்பங்கள் - மொழிபெயர்ப்பின் வகைகளைக் கற்பித்தல் வேண்டும்)

துறை சாரா விருப்பப்பாடம் - 2

தாள் - 2

17U4ATANM - தமிழ்ப் பண்பாடு - அறிமுகம்.

அலகு - 1 பண்பாடு.

பண்பாடு - சொல் பொருள் - பல்வேறு விளக்கங்கள்.

அலகு - 2 பண்பாட்டுப் பெட்டகம்.

உண்ணம் பார்த்தல் - ஏறு தழுவுதல் - புதுமணல் பரப்பல் - நீருடைக் கலிங்கம் - தாழியில் புதைத்தல்.

அலகு - 3 வாழ்க்கை முறை.

அன்றாட வாழ்க்கை - உணவு முறை - ஆடை அணிகலன்கள் - திருமணம் - விருந்தோம்பல் - பழக்க வழக்கங்கள் - நம்பிக்கைகள்.

அலகு - 4 வழிபாடு.

வழிபாடுகள் - விழாக்கள் - சடங்குகள் - மனித உறவுகள் - குடும்ப உறவுகள்.

அலகு - 5 கலைகள்.

கட்டடக் கலை - சிற்பக் கலை - ஓவியக் கலை - இசைக் கலை - நடனக் கலை - கை வினைஞர்.

பாடநூல் : தமிழ்மொழி, இலக்கியம், பண்பாடு - அறிமுகம்.
         சென்னைப் பல்கலைக்கழக வெளியீடு.

பாட பகுதி : பண்பாடு மட்டும்.

பார்வை நூல் :

தமிழ்ப் பண்பாடு - முனைவர் த. அருள் பத்மராசன்.

மூன்றாம் ஆண்டு

ஐந்தாம் பருவம்

சிறப்புப்பாடம் - தாள் - 9

17U5TA9 - இலக்கியம் - 5 சங்க இலக்கியம் (புறம்).

அலகு 1	:	பதிற்றுப்பத்து - இரண்டாம்பத்து.
அலகு 2	:	புறநானூறு – ஒளவையார் பாடல்கள்.
அலகு 3	:	பரிபாடல்

'மா அ யோயே' என்று தொடங்கும் 3 ஆம் பாடல்
'இருநிலம் துளங்காமை' என்று தொடங்கும் 9 ஆம் பாடல்.

அலகு 4	:	பத்துப்பாட்டு - பொருநராற்றுப்படை.
அலகு 5	:	திருக்குறள் - பொருட்பால்- இறைமாட்சி முதல் இடனறிதல் வரை.

தாள் - 10

17U5TA10 - இலக்கணம் - 5

பாடநூல்   :   புறப்பொருள் வெண்பாமாலை - பாடாண் படலம் முடிய.

அலகு 1   :   வெட்சிப்படலம், கரந்தைப்படலம்.

அலகு 2   :   வஞ்சிப்படலம், காஞ்சிப்படலம்.

அலகு 3   :   நொச்சிப்படலம், உழிஞைப்படலம்.

அலகு 4   :   தும்பைப்படலம், வாகைப்படலம்.

அலகு 5   :   பாடாண் படலம்.

தாள் - 11

17U5TA11 – தமிழ் மொழி வரலாறு.

பாட நூல் - மு. வரதராசன் -மொழி வரலாறு.

அலகு 1 : மொழி அரிய கலை — பேச்சு மொழியும் எழுத்து மொழியும் - உணர்ச்சி மொழி, அறிவு மொழி, செயல் மொழி — மொழியின் பண்பாடு — போலச்செய்தல் - ஒப்புமையாக்கம் - மூடநம்பிக்கைகள் வழக்கம்.

அலகு 2 : இலக்கணம் - நாகரிகம் - ஒரு பொருட் கிளவிகள் - கடன் வாங்கள் - மரூவு — ஒலித்திரிபு.

அலகு 3 : இலக்கிய மொழியின் செல்வாக்கு — கிளை மொழி — பொது மொழி — சிறப்பு மொழி — குறு மொழி — குழந்தை மொழி.

அலகு 4 : மொழியின் தோற்றம் - மொழி நிலைகள் - மொழியினங்கள் - ஆரிய மொழியினம்.

அலகு 5 : திராவிட மொழியினம் - தமிழ் - எழுத்து — எண்கள்.

தாள் - 12

17U5TA12 - இலக்கியத் திறனாய்வு

பாடநூல்   :   டாக்டர் சு. பாலச்சந்திரன் - இலக்கியத் திறனாய்வு

அலகு 1   :   இலக்கியத் திறனாய்வு.

அலகு 2   :   இலக்கியம்.

அலகு 3   :   கவிதை.

அலகு 4   :   நாவல், சிறுகதை.

அலகு 5   :   நாடகம், புதுக்கவிதை.

பார்வை நூல்கள் :

டாக்டர் மு. வரதராசனார் - இலக்கியத்திறன்
பாரிநிலையம், 184, பிராட்வே, சென்னை - 600 108.

அ.ச. ஞானசம்பந்தன் - இலக்கியக்கலை
கழக வெளியீடு, சென்னை - 600 108.

டாக்டர் தா.ஏ. ஞானமூர்த்தி - இலக்கியத் திறனாய்வியல்
ஐந்திணைப் பதிப்பகம்
279, பாரதிசாலை மாடியில், திருவல்லிக்கேணி, சென்னை - 600 005.

முனைவர் கே. பழனிவேலு - கோட்பாட்டியல் திறனாய்வுகள்
அகரம், மனை எண்.1, நிர்மலா நகர், தஞ்சாவூர் - 613 007.

விருப்பப்பாடம் - 1

தாள் - 1

அ.   இணையம்

ஆ.   **நாட்டுப்புறவியல்** ✔

இ.   விளம்பரவியல்

குறிப்பு : மேற்கண்ட மூன்று விருப்பப் பாடங்களில் ஏதேனும் ஒன்றைத் தெரிவு செய்து
கொள்ளலாம்

விருப்பப்பாடம் - 1

தாள் - 1

17U5TAE1 - நாட்டுப்புறவியல்

அலகு 1   :   நாட்டுப்புறவியல் வரலாறு - விளக்கம் - நாட்டுப்புறவியல்
சமூகவியல் - மானுடவியல் - உளவியல் நோக்கு - நாட்டுப்புற
இலக்கியமும் ஏட்டிலக்கியமும் - பழமொழிகள் - விடுகதைகள் -
புராணக் கதைகள்.

அலகு 2   :   நாட்டுப்புறவியல் வளர்ச்சி வரலாறு - தொல்காப்பியம் குறிப்பிடும்
பண்ணத்தி, பிசி, புலன் சங்க இலக்கியங்களின் வள்ளைப்பாட்டு
முதலியன. சிலப்பதிகாரத்தின் வரிப்பாடல்கள் - குறவைப்பாட்டு -
திருவாசகத்தின் திருப்பொற்சுண்ணம் முதலானவை - சிற்றிலக்கிய
வகைகளின் வளர்ச்சி - தாயுமானவர் - இராமலிங்கர் - பாரதியார்
- பாரதிதாசன் ஆகியோர் பாடல்களில் நாட்டுப்புறப் பாடல்களின்
வடிவங்கள்.

அலகு 3   :   ஏட்டிலக்கியத்திற்கும் - வாய்மொழி இலக்கியத்திற்கும் இடையே
உள்ள ஒற்றுமை, வேற்றுமைகள் - பழக்க வழக்கங்கள் -
நாகரிகமும் பண்பாடும் - சமய உணர்ச்சி - வாழ்க்கைநெறி
போன்றவை - நாட்டுப்புறக் கலைகள் - கூத்து - ஆட்டம் -
நடனம் - கும்மி - கோலாட்டம்.

அலகு 4   :   நாட்டுப்புறப் பாடல்கள் - வகைகள் - குழந்தைப்பாடல்கள் -
தொழில் பாடல்கள் - விளையாட்டுப் பாடல்கள் -
கொண்டாட்டப் பாடல்கள் - உணர்ச்சிப் பாடல்கள் - இழவு -
சடங்குப் பாடல்கள் முதலானவை.

அலகு 5 : நாட்டுப்புறப் பாடல்கள் பாடும் நேரமும் இடமும் - வடிவங்கள் - மெட்டுகள் - இசையொலிகள் - பாநலம் - வருணணை - உவமை - கற்பனை - நீதிகள் முதலியன - நாட்டுப்புறக் கதைகள் - வகைகள் - கதைப் பாடல்கள் முதலானவை.

பார்வை நூல்கள் :

1. சு. சக்திவேல் - நாட்டுப்புற இயல் ஆய்வு
    மணிவாசகர் பதிப்பகம்,
    12ஆ, மேலசன்னதி வீதி, சிதம்பரம் - 1

2. சு. சண்முக சுந்தரம் - நாட்டுப்புற இயல்
    மணிவாசகர் பதிப்பகம்,
    8/7. சிங்கர் தெரு, பாரிமுனை, சென்னை -108.

3. ஆறு. அழகப்பன் - நாட்டுப்புறப் பாடல்கள் - திறனாய்வு
    கழக வெளியீடு, 79, பிரகாசம் சாலை, சென்னை-1

4. ஆறு. இராமநாதன் - நாட்டுப்புறவியல் ஆய்வுகள்
    மணிவாசகப் பதிப்பகம், சிதம்பரம் - 608 000.

தாள் - 3

திறன் அடிப்படையிலான விருப்பப்பாடம் - 3

17U5TASB - கல்வெட்டியல்.

பாடநூல்   :   இரா. நாகசாமி நடனகாசிநாதன், கு.தாமோதரன், ச.ஹரிஹரன்
கல்வெட்டியல் கட்டுரைகள் - 3, 7 முதல் 15 முடிய
தமிழ்நாடு அரசு தொல்பொருள் ஆய்வுத் துறை
சென்னை - இரண்டாம் பதிப்பு - 1980

அலகு 1   :   தமிழ் எழுத்து, கல்வெட்டின் அமைப்பு.

அலகு 2   :   தமழிக் கல்வெட்டுக்கள், தமிழ்க் கல்வெட்டுக்கள்.

அலகு 3   :   தமிழ்க் கல்வெட்டுக்கள் - 2, தமிழ்க் கல்வெட்டுக்கள் - 3.

அலகு 4   :   தமிழ்க் கல்வெட்டுக்கள் - 4, வடமொழிக் கல்வெட்டுக்கள்.

அலகு 5   :   நடுகல், செப்பேடுகள்.

மூன்றாம் ஆண்டு

ஆறாம் பருவம்

சிறப்புப்பாடம் தாள் - 13

17U6TA13 - இலக்கியம் 6 - சங்க இலக்கியம் (அகம்)

அலகு 1 : நற்றிணை - 91 முதல் 110 முடிய.

அலகு 2 : குறுந்தொகை - 91 முதல் 110 முடிய.

அலகு 3 : கலித்தொகை – முல்லைக் கலி.

அலகு 4 : அகநானூறு – 81 முதல் 90 வரை.

அலகு 5 : பத்துப்பாட்டு – நெடுநல்வாடை.

தாள் - 14

17U6TA14 - இலக்கணம் - 6 நம்பியகப்பொருள்

பாடநூல் :   நம்பியகப் பொருள்

அலகு 1	:	அகத்திணையியல் I (1 முதல் 54 நூற்பா வரை)
அலகு 2	:	அகத்திணையியல் II (55 முதல் 116 நூற்பா வரை)
அலகு 3	:	களவியல்.
அலகு 4	:	வரைவியல், கற்பியல்.
அலகு 5	:	ஒழிபியல்

தாள் - 15

17U6TA15 - திராவிட மொழிகளின் ஒப்பிலக்கணம்

பாடநூல்   :   திராவிட மொழிகளின் ஒப்பிலக்கணம் (திராவிட மொழிகள் ச. அகத்தியலிங்கம்)

அலகு 1 : ஒலிவகை, உயிரொலிகள் - மெய்யெழுத்துகள் - ஒலியளவு.

அலகு 2 : ஒலியழுத்தம் - ஒலியசை முறை - சொல்லின் திரிபு - அடிச்சொற்கள்.

அலகு 3 : பெயர்ச்சொல் - வேற்றுமை - மூவிடப் பெயர்கள் எண்ணுப் பெயர்கள்.

அலகு 4 : வினைச்சொல் - வினைவகை - சுட்டு முதலியன.

அலகு 5 : சொல்லும் பொருளும் - சொற்றொடர்.

விருப்பப்பாடம் - 2 தாள் - 2

அ. இதழியல் ✓

ஆ. புத்தகப் பதிப்பியல்

இ. தமிழகம் - ஊர், பெயர் வரலாறு

குறிப்பு : மேற்கண்ட மூன்று விருப்பப்பாடங்களில் ஏதேனும் ஒன்றைத் தெரிவு செய்து கொள்ளலாம்

விருப்பப்பாடம் - 2

தாள் - 2

17U6TAE2 - அ. இதழியல்.

பாடநூல் : இதழியல் கலை - டாக்டர் மா.பா.குருசாமி.

அலகு 1 : இதழியல் : விளக்கம் - இதழ்களின் பணிகளும் பொறுப்புகளும் - இதழ்களின் வகைகளும் இயல்புகளும் - மக்களாட்சியில் இதழியல் - இதழ்களின் சுதந்திரம் - இதழ்களின் நடத்தையறக் கோட்பாடுகள் - இதழியல் தொழில் வாய்ப்புகள்.

அலகு 2 : இதழியல் வளர்ச்சி வரலாறு - தமிழகத்தில் இதழியல் வளர்ச்சி - பத்திரிகைச் சட்டங்கள் - பத்திரிகை மன்றம் - இதழ்கள் தொடங்குவதற்குரிய வழிமுறை, செய்தித்தாள் நிர்வாக அமைப்பு.

அலகு 3 : செய்தியாளர் - செய்தி - செய்தியின் உள்ளடக்கங்கள் - செய்தி திரட்டுதல் - செய்தி நிறுவனங்கள் - பேட்டி குற்றச் செய்திகள் பல்வேறு வகையான செய்திகள் - செய்திகளும் சிறப்புத் தனி இயல்புகளும் - படங்களும் இதழ்களும்.

அலகு 4 : செய்திகளைச் செப்பனிடுதல் - நுட்பங்கள் - ஆசிரியர் - செய்தி ஆசிரியர் - துணை ஆசிரியர்கள் - செய்தியின் கட்டமைப்பு - பக்க வடிவமைப்பு - அச்சுப்படி திருத்துல் - அச்சுப்பிழை திருத்தக் குறியீடுகள் - இதழியல் கலைச் சொற்கள்.

அலகு 5 : இதழியல் மொழிநடை - தலையங்கம் - சிறப்புத் தனிக் கூறுகள் - திறனாய்வு - இதழ்களில் எழுதுவது எப்படி? - இதழ்களில் விளம்பரம் - தற்காலத் தமிழ் இதழ்களின் எழுச்சியும் வீழ்ச்சியும் - நல்ல இதழ்கள் : எவை? எப்படி?

பார்வை நூல்கள் :

டாக்டர் கு.முத்துராசன் - இதழியல் வளர்ச்சியும் மொழி பெயர்ப்பும்
ஐந்திணைப் பதிப்பகம், அஞ்சல் பெட்டி எண்.2989
279, பாரதி சாலை - மாடியில்
(பைகிராப்ட்ஸ் சாலை)
திருவல்லிக்கேனி, சென்னை - 600 005   2001

இரா. கோதண்டபாணி, இதழியல்
கற்பக நூலகம், 21அ. ஆசாரி தெரு,
தல்லாகுளம், மதுரை - 625 002   1980

கோ. கலைவாணி - பத்திரிக்கைக் கலை
சாரதா வெளியீடு, 4, மானம் பார்த்த சமேதார் தெரு,
குயப்பேட்டை, வேலூர் - 632 001.   1988

டாக்டர். தங்கமணியன் - பத்திரிகையியல்
மாணிக்கம் பதிப்பகம், மானச கங்கோத்திரி
மைசூர் - 570 006.   1998

விருப்பப்பாடம் - 3

தாள் -3

அ.   தமிழர் அழகுக் கலைகள்

ஆ.   பெண்ணியம் ✓

இ.   சுற்றுலாவியல்

மேற்கண்ட மூன்று விருப்பப்பாடங்களில் ஏதேனும் ஒன்றைத் தெரிவு செய்து கொள்ளலாம்.

17U6TAE3 -   ஆ. பெண்ணியம்

பாடநூல்   :   பெண்ணியம் - முனைவர் இரா. பிரேமா,

அலகு 1   :   பெண்ணியம் - சொற்பொருள் - விளக்கம் - பெண்ணியத்தின் தோற்றமும் வளர்ச்சியும் - 1970 -75 ஆம் ஆண்டுகளில் பெண்ணிய வளர்ச்சி முதலானவை – (பக் 1 முதல் 33 வரை).

அலகு 2   :   எண்பதுகளில் பெண்ணியம் - பெண்ணியத்தின் எதிர்காலம் - பெண்ணிய வகைகள் - முதலானவை -(பக் 34 முதல் 55 வரை).

அலகு 3   :   குடும்ப அமைப்பு – பால்தன்மை – பெண்ணின் வரலாறு – தீவிரம் பெண்ணிய வாதிகளின் செயற்பாடுகள் - பெண்ணியக் கோட்பாட்டாளர்கள் போன்றவை பெண்ணிய நூல்கள் (பக் 56 முதல் 75 வரை).

அலகு 4   :   மகளிரியல் கல்வி – பெண்ணிய இயக்கத் திறனாய்வு – மொழியும் உளவியல் பகுப்பாய்வும் - மார்க்சியப் பெண்ணியம். (பக் 76 முதல் 96 வரை).

அலகு 5   :   இந்தியப் பெண்ணிய வரலாறு - இந்தியப் பெண்களின்
.   கூட்டமைப்பு - இந்திய தேசிய பெண்கள் குழு – அகில இந்திய
.   பெண்கள் மாநாடு முதலானவை (பக் 97 முதல் 117 வரை).

பார்வை நூல்கள் :

1.   பெண்ணியம் தோற்றமும் வளர்ச்சியும்
       டாக்டர் முத்து சிதம்பரம், தமிழ்ப் புத்தகலாயம்,
       சிவப்பிரகாசம் தெரு, தி. நகர், சென்னை.

2.   பெண்ணியம் ஓர் ஆய்வு – பேராசிரியர் நா. ஜெயபாலன், மோகன்பதிப்பகம், 4 பாரதி சாலை , திருவல்லிக்கேனி, சென்னை – 5.

திறன் அடிப்படையிலான விருப்பப்பாடம் - 4

தாள் - 4

17U6TASB - தகவல் தொடர்பியல்

பாடநூல் : முனைவர் கி. இராசா - மக்கள் தகவல் தொடர்பியல் அறிமுகம்
பாவை பப்ளிகேஷன்ஸ், 142, ஜானி ஜான்கான் சாலை,
இராயப்பேட்டை, சென்னை - 600 014.

அலகு 1 : கொள்கைகளும் கோட்பாடுகளும்.

அலகு 2 : தகவல் தொடர்புச் சாதனங்கள்.

அலகு 3 : வானொலி.

அலகு 4 : தொலைக்காட்சி, திரைப்படம்.

அலகு 5 : விளம்பரம்.

பார்வை நூல்கள் :

1. வே. தயாளன், வ. ஜெயா - மக்கள் தகவல் தொடர்பியல்
   ஜெயா பதிப்பகம், கோயம்புத்தூர். 1998

2. முனைவர் மு.கோமதி - தகவல்தொடர்பு ஊடகங்களில் இலக்கியச் செல்வாக்கு,
   மோகன் முகில் பதிப்பகம்,
   10, தண்டபாணி நகர், கோண்டூர், கடலூர்-2

3. வெ. கிருஷ்ணமூர்த்தி - தகவல் தொடர்பியல்
   மணிவாசகர் பதிப்பகம், சென்னை. 1991

4. வெ. நல்லதம்பி - தொலைக்காட்சியும் பிறதகவல் துறைகளும்
   வள்ளுவன் வெளியீட்டகம், திருவான்மியூர், சென்னை -41. 1990

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37

B.A. தமிழ் பருவ முறை

வினாப் பகிர்வு

மொத்த மதிப்பெண் - 75

அலகு வரிசை	பகுதி – 1		பகுதி – 2		பகுதி - 3	
	வினா எண்ணிக்கை	மதிப் பெண்	வினா எண்ணிக்கை	மதிப் பெண்	வினா எண்ணிக்கை	மதிப் பெண்
அலகு 1	2	2x2 = 4	2 A(அ)B	1x5 = 5	1	1x10 = 10
அலகு 2	2	2x2 = 4	2 A(அ)B	1x5 = 5	1	1x10 = 10
அலகு 3	2	2x2 = 4	2 A(அ)B	1x5 = 5	1	1x10 = 10
அலகு 4	2	2x2 = 4	2 A(அ)B	1x5 = 5	1	1x10 = 10
அலகு 2	2	2x2 = 4	2 A(அ)B	1x5 = 5	1	1x10 = 10
	10	**10x2 = 20**	**10**	**5x5 = 25**	**5**	**3x10 = 30**

(பகுதி 1 = 20) + (பகுதி 2 = 25) + (பகுதி 3 = 30) = 75

MUTHURANGAM GOVERNMENT ARTS COLLEGE

(AUTONOMOUS)

VELLORE – 632 002.

MASTER OF ARTS

M.A. TAMIL

Syllabus

UNDER CBCS

(With effect from 2017 - 2018)

Muthurangam Government Arts College (Autonomous), Vellore – 2.

MASTER OF ARTS

DEGREE COURSE

M.A. TAMIL

UNDER CBCS

(With effect from 2017-2018)

The Course of Study and the Scheme of Examinations

S. No	Study Components / Course Title		Ins. hrs / week	Credit	Title of the Paper / Subject Code		Maximum Marks		
							CIA	ESE	Total
SEMESTER I							CIA	ESE	Total
1	MAIN	Paper-1	6	5	இக்கால இலக்கியம்-I	17P1TA1	25	75	100
2	MAIN	Paper-2	6	5	அற இலக்கியம்.	17P1TA2	25	75	100
3	MAIN	Paper-3	6	4	காப்பியங்கள்.	17P1TA3	25	75	100
4	MAIN	Paper-4	6	4	தொல்காப்பியம் எழுத்ததிகாரம்- I	17P1TA4	25	75	100
5	ELECTIVE	Paper-1	6	3	(பின்வருவனவற்றுள் ஏதேனும் ஒன்று) 1. தமிழ்ப் பண்பாட்டு வரலாறு. 2. சமயமும் தமிழிலக்கியமும். 3. ஒப்பிலக்கியம் ✓ 4. இதழியலும் மக்கள் தொடர்பியலும்.	17P1ETA	25	75	100
			30	21			125	375	500
SEMESTER II							CIA	ESE	Total
6	MAIN	Paper-5	6	5	இக்கால இலக்கியம்-II.	17P2TA5	25	75	100
7	MAIN	Paper-6	6	5	பக்தி இலக்கியங்கள்.	17P2TA6	25	75	100
8	MAIN	Paper-7	5	4	தொல்காப்பியம் எழுத்ததிகாரம்- II .	17P2TA7	25	75	100
9	MAIN	Paper-8	5	4	தொல்காப்பியம் சொல்லதிகாரம் -I.	17P2TA8	25	75	100
10	Compulsory Paper		2	2	Human Rights .	17P2HR	25	75	100
11	ELECTIVE	Paper-2	6	3	(பின்வருவனவற்றுள் ஏதேனும் ஒன்று:) 1. கோயிற்கலையும் பண்பாடும் ஆட்சியும். 2. கம்பர். 3. சித்தர் இலக்கியம். 4. பொதுமொழியியல் ✓	17P2ETA	25	75	100
			30	23			150	450	600

S. No	Study Components / Course Title		Ins. hrs / week	Credit	Title of the Paper / Subject Code		Maximum Marks		
							CIA	ESE	Total
SEMESTER III							CIA	ESE	Total
12	MAIN	Paper-9	6	5	சங்க இலக்கியம்-I.	17P3TA9	25	75	100
13	MAIN	Paper-10	6	5	ஆராய்ச்சி நெறிமுறைகள்.	17P3TA10	25	75	100
14	MAIN	Paper-11	6	5	தொல்காப்பியம் சொல்லதிகாரம்- II.	17P3TA11	25	75	100
15	MAIN	Paper-12	6	5	தொல்காப்பியம் பொருளதிகாரம்-I.	17P3TA12	25	75	100
16	ELECTIVE	Paper-3	6	3	பின்வருவனவற்றுள் ஏதேனும் ஒன்று) 1. அக இலக்கியக் கோட்பாடுகள். 2. இளங்கோவடிகள். 3. உமறுப் புலவர். 4. பெரியாரியல் ✓	17P3ETA	25	75	100
			30	23			125	375	500
SEMESTER IV							CIA	ESE	Total
17	MAIN	Paper-13	6	5	சங்க இலக்கியம்-II.	17P4TA13	25	75	100
18	MAIN	Paper-14	6	5	சிற்றிலக்கியம்.	17P4TA14	25	75	100
19	MAIN	Paper-15	6	5	தொல்காப்பியம். பொருளதிகாரம்-II.	17P4TA15	25	75	100
20	MAIN	Paper-16	6	5	திருவள்ளுவர்.	17P4TA16	25	75	100
21	ELECTIVE	Paper-4	6	3	(பின்வருவனவற்றுள் ஏதேனும் ஒன்று:) 1. சங்க காலம். ✓ 2. சைவ சித்தாந்தம். 3. தமிழுக்குக் கணினியின் பயன்பாடு.	17P4ETA	25	75	100
			30	23			125	375	500

Subject	Papers	Credit	Total credits	Marks	Total Marks
MAIN	16	4-5	76	100	1600
ELECTIVE	4	3	12	100	400
COMPULSORY PAPER	1	2	2	100	100
Total	**21**	**-**	**90**	**-**	**2100**

முத்துரங்கம் அரசினர் கலைக் கல்லூரி (தன்னாட்சி).

முதுகலை : தமிழ்

நடைமுறை 2017 – 2018

முதல் ஆண்டு

முதற் பருவம்

தாள் - 1

17P1TA1 இக்கால இலக்கியம் - 1

அலகு 1   :   பாரதியார் – பாஞ்சாலி சபதம்.

அலகு 2   :   பாரதிதாசன் - பாண்டியன் பரிசு.

அலகு 3   :   ஈரோடு தமிழன்பன் - வணக்கம் வள்ளுவ!

அலகு 4   :   கி.வா.ஜகந்நாதன் - உ.வே.சா. என் சரித்திரம் (சுருக்கம்)

அலகு 5   :   க. சுப்பிரமணியபிள்ளை - தமிழர் சமயம், உரைநடை,

பார்வை நூல்கள் :

1.   இரா. வல்லிக்கண்ணன்   :   புதுக்கவிதை தோற்றமும் வளர்ச்சியும்,
                எழுத்து பிரசுரம்,
                19-A, பிள்ளையார் கோயில் தெரு,
                திருவல்லிக்கேணி,
                சென்னை - 600 005, 1977.

2.   பிரேமா நந்தகுமார்   :   சுப்பிரமணிய பாரதியார்,
                சாகித்திய அகாதெமி,
                தேனாம்பேட்டை, சென்னை - 600 018, 1983.

3.   பாலா   :   புதுக்கவிதை ஒரு புதுப்பார்வை,
                அகரம், நிர்மலா நகர்,
                தஞ்சாவூர் - 613 001, 2006.

4.   நிர்மலா சுரேஷ்   :   தமிழில் ஹைக்கூ கவிதைகள்,
                திருமகள் நிலையம், தி.நகர்,
                சென்னை - 600 017, 1981.

5.   க.த. திருநாவுக்கரசு   :   தமிழ்க் கவிதையில் பாரதியின் தாக்கம்,
                உலகத் தமிழாராய்ச்சி நிறுவனம்,
                தரமணி, சென்னை - 600 113.

தாள் II

17P1TA2 - அற இலக்கியம்

அலகு 1 : திருக்குறள் - அறத்துப்பால்.

அலகு 2 : நாலடியார் - பொருட்பால் அரசியல் மட்டும் (14 கல்வி முதல் 20 தாளாண்மை வரை).

அலகு 3 : திரிகடுகம் 16-30 பாடல் வரை.
ஆசாரக்கோவை 21-30 பாடல் வரை.

அலகு 4 : நல்வழி - 40 பாடல்கள்.

அலகு 5 : நன்னெறி - 40 பாடல்கள்.

பார்வை நூல்கள்:

1. க.த. திருநாவுக்கரசு : திருக்குறள் நீதி இலக்கியம்,
   சென்னைப் பல்கலைக்கழகம், சென்னை,
   முதல் பதிப்பு, 1971.

2. வ.சுப. மாணிக்கம் : வள்ளுவம்,
   பாரி நிலையம், சென்னை, முதற்பதிப்பு, 1953.

3. சிவகாமி : தமிழில் சதக இலக்கியம்.

4. டாக்டர் நா. சுப்பிரமணியம் : இந்தியச் சிந்தனை மரபு.

தாள் III

17P1TA3 - காப்பியங்கள்

அலகு 1 : சிலப்பதிகாரம் - புகார்க்காண்டம் மட்டும்.

அலகு 2 : பெரியபுராணம் - அப்பூதியடிகள் புராணம்.

அலகு 3 : கம்பராமாயணம் - கும்பகர்ணன் வதைப் படலம் மட்டும்.

அலகு 4 : தேம்பாவணி – பிரிந்த மகவைக்காண் படலம். (முதல் 50 பாடல்கள்)

அலகு 5 : சீறாப்புராணம் - (ஹிஜிரத்துக் காண்டம்) விடம் மீட்ட படலம்.

பார்வை நூல்கள்:

1. மு. வரதராசனார் : இளங்கோவடிகள், கண்ணகி, மாதவி,
பாரி நிலையம், 59, பிராட்வே, சென்னை - 8.

2. தெ.பொ. மீனாட்சி சுந்தரனார் : கானல் வரி, குடிமக்கள் காப்பியம்,
மீனாட்சி புத்தக நிலையம், மதுரை - 1,
1974.

3. அ.ச. ஞானசம்பந்தன் : கம்பன் புதிய பார்வை,
கம்பன் கழக வெளியீடு,
வானதி பதிப்பகம், 13, தீனதயாளு தெரு,
தி.நகர், சென்னை - 17, 1984.

4. அ.ச. ஞானசம்பந்தன் : பெரியபுராணம் ஓர் ஆய்வு,
தமிழ்ப்பல்கலைக்கழக வெளியீடு,
தஞ்சாவூர், 1987.

5. வ.சு.ப.மாணிக்கம் : இரட்டைக் காப்பியங்கள்.

தாள் IV

17P1TA4 - தொல்காப்பியம் - எழுத்ததிகாரம் - I

அலகு 1 : நூன்மரபு.

அலகு 2 : மொழிமரபு.

அலகு 3 : பிறப்பியல்.

அலகு 4 : புணரியல்.

அலகு 5 : தொகைமரபு.

பார்வை நூல்கள்:

1. மு. சண்முகம் பிள்ளை (ப.ஆ.), : தொல்காப்பியம் எழுத்ததிகாரம்,
   184, பிராட்வே, முல்லை நிலையம்,
   சென்னை - 600 108.

2. ச.வே. சுப்பிரமணியம் (ப.ஆ.) : தொல்காப்பியம் எழுத்ததிகாரம்
   (உரை வளங்கள்),
   உலகத் தமிழாராய்ச்சி நிறுவனம்,
   தரமணி, சென்னை - 600 113

3. கு. சுந்தரமூர்த்தி (ப.ஆ.) : தொல்காப்பியம் எழுத்ததிகாரம்,
   அண்ணாமலைப் பல்கலைக்கழகம்,
   அண்ணாமலை நகர், - 608 002, 1986.

4. செ.வை. சண்முகம் : எழுத்திலக்கணக் கோட்பாடு,
   உலகத் தமிழாராய்ச்சி நிறுவனம்,
   தரமணி, சென்னை - 600 113.

5. தி. முருகரத்தினம் : தமிழ் எழுத்தியல் அன்றும் இன்றும்,
   மதுரைப் பல்கலைக்கழகம், சர்வோதய
   இலக்கியப் பண்ணை, மதுரை - 625 001

6. ஆ. சிவலிங்கனார் : தொல்காப்பிய உரைவளம்,
   உலகத் தமிழாராய்ச்சி நிறுவனம்,
   தரமணி, சென்னை - 600 113.

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விருப்பப்பாடம் I

தாள் I

17P1ETA - 1. ஒப்பிலக்கியம்

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அலகு 1 : ஒப்பிலக்கியம் வரையறை, விளக்கம் - மேனாடுகளில் ஒப்பிலக்கியத் தோற்றம் வளர்ச்சி - இந்தியாவில், தமிழகத்தில் ஒப்பிலக்கியத் தோற்றம் வளர்ச்சி - தமிழில் ஒப்பிலக்கியப் போக்குகள், சிந்தனைகள், பயன்பாடுகள்.

அலகு 2 : நான்கு வகை இலக்கியப் பார்வைகள் - தேசிய இலக்கியம் - உலக இலக்கியம் - பொதுமை இலக்கியம் - ஒப்பிலக்கியம் - இலக்கிய வகைப்பாடுகள் - இலக்கிய ஒப்பீடு - வரலாற்று ஒப்பீடு - மொழி ஒப்பீடு.

அலகு 3 : ஒப்பிலக்கியக் கோட்பாடுகள் - பிரெஞ்சுக் கோட்பாடு - அமெரிக்கக் கோட்பாடுகள் - ஒப்பிலக்கிய அறிவியல் ஆய்வு நெறிமுறைக் கோட்பாடுகள் - இணைவரை - ஏற்பு - தாக்கம் - செல்வாக்குப் பாலங்கள் - இலக்கிய வரலாறு - இலக்கிய வகைமை - அடிக்கருத்தியல் - மொழிபெயர்ப்பு.

அலகு 4 : ஒப்பாய்வுக் களங்கள்; - நாட்டுப் புறமும் ஏட்டிலக்கியமும் - இலக்கியமும் நுண்கலைகளும் - இலக்கியமும் உளவியலும் - இலக்கியமும் பிறதுறைகளும் - இலக்கியமும் சமுதாயமும்.

அலகு 5 : வீரயுகப் பாடல்கள் - தன்னுணர்ச்சிப் பாடல்கள் - இயற்கைப் புனைவுப் பாடல்கள் - முல்லைப் பாடல்கள்.

பார்வை நூல்கள்:

1. காஞ்சனா : ஒப்பிலக்கிய மரபும் திறனும், பதிப்புத்துறை, மதுரை காமராசர் பல்கலைக் கழகம், மதுரை.

2. க. கைலாசபதி : ஒப்பியல் இலக்கியம், சென்னைப் புக் ஹவுஸ், 6, மேட்லி சாலை, சென்னை - 17.

3. வை. சச்சிதானந்தன் : ஒப்பிலக்கியம் (ஓர் அறிமுகம்), ஆக்ஸ்போர்டு யுனிவர்சிட்டி பிரஸ், சென்னை - 1985.

4. ந. சரவணன் : ஒப்பிலக்கியம் (ஓர் அறிமுகம்), ஆக்ஸ்போர்டு யுனிவர்சிட்டி பிரஸ், சென்னை - 1985.

5. க. சிவகாமி : ஒப்பிலக்கியத் தமிழ், மாதவி பதிப்பகம்,

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17 - ஸ்ரீபுரம் இரண்டாவது தெரு,
இராயப்பேட்டை, சென்னை - 600 014.

6. அ. சிவபெருமான் : தமிழும் அறிவியலும்,
கயிலாயநாதர் பதிப்பகம்,
குகையூர் அஞ்சல், விழுப்புரம் மாவட்டம் - 606 306
முதற்பதிப்பு - டிசம்பர் 2006.

7. க. நா. சுப்பிரமணியன் : உலக இலக்கியம்,
தமிழியல் துறை வெளியீடு,
புதுவைப் பல்கலைக் கழகம், புதுச்சேரி, 1989.

8. வ. சுப. மாணிக்கம் : ஒப்பியல் நோக்கு,
மணிவாசகர் பதிப்பகம்,
55, லிங்கித் தெரு, சென்னை - 1
இரண்டாம் பதிப்பு - 1988.

9. தமிழண்ணல் : ஒப்பிலக்கிய அறிமுகம்,
சோலை நூலக வெளியீடு,
மதுரை - 1973.

10. தமிழண்ணல் : சங்க இலக்கிய ஒப்பீடு - இலக்கியக் கொள்கைகள்,
சோலை நூலக வெளியீடு,
மதுரை - 1975.

11. ம. திருமலை : ஒப்பிலக்கியம் கொள்கைகளும் பயில்முறையும்
மீனாட்சி புத்தக நிலையம்,
மயூரா வளாகம் - மதுரை 625 007.
முதற்பதிப்பு டிசம்பர் - 2003.

12. கதிர். மகாதேவன் : ஒப்பிலக்கிய நோக்கில் சங்ககாலம்,
சர்வோதய இலக்கியப் பண்ணை,
மதுரை - 1975.

13. சி. மெய்கண்டான் : ஒப்பாய்வு நோக்கில் கம்பன்,
பவளவிழா வெளியீடு,
பதிப்புத் துறை,
அண்ணாமலைப் பல்கலைக்கழகம்
முதற்பதிப்பு - 2004.

முதல் ஆண்டு

இரண்டாம் பருவம்

தாள் **V**

17P2TA5 - இக்கால இலக்கியம் **II**

அலகு 1 : டாக்டர் மு.வரதராசன் — கரித்துண்டு (புதினம்)

அலகு 2 : கி. இராஜநாராயணன் - கோபல்லபுரம் (புதினம்)

அலகு 3 : அறிஞர் அண்ணா — சந்ரோதயம் (நாடகம்)

அலகு 4 : அ. முத்துலிங்கம் — அங்கே இப்ப என்ன நேரம் (உரைநடை)

அலகு 5 : புதுமைப்பித்தன் சிறுகதைகள் (முல்லை நிலையம்)

பார்வை நூல்கள்:

1. சிவபாத சுந்தரராசன் : தமிழ் நாவல் நூற்றாண்டு வரலாறும்
வளர்ச்சியும், கிரியா பதிப்பகம்,
CREA. 3, புது எண் 9, தெற்கு அவென்யு,
திருவான்மியூர், சென்னை - 600 041.

2. கா. சிவத்தம்பி : சிறுகதையின் தோற்றமும் வளர்ச்சியும்,
தமிழ்ப் புத்தகாலயம், தி.நகர்,
சென்னை - 600 017.

3. மா. இராமலிங்கம் : இருபதாம் நூற்றாண்டுத் தமிழ் இலக்கியம், புதிய
உரைநடை,
தமிழ்ப் புத்தகாலயம், தி.நகர்,
சென்னை - 600 017.

4. அவ்வை தி.க. சண்முகம் : நாடகக் கலை.

தாள் VI

17P2TA6 - பக்தி இலக்கியங்கள்.

அலகு 1 : அ. திருஞானசம்பந்தர் - தோடுடைய செவியன் - முதல் பதிகம் மட்டும்.

ஆ. திருநாவுக்கரசர் - கூற்றாயினவாறு, ஒன்றுகொலாம்,தலையே நீ வணங்காய்

அலகு 2 : அ. ஆண்டாள் - நாச்சியார் திருமொழி முழுவதும்.

ஆ. குலசேகராழ்வார் - பெருமாள் திருமொழி முழுவதும்.

அலகு 3 : அ. காரைக்கால் அம்மையார், திருவாலங்காட்டு மூத்த திருப்பதிகம் முழுவதும்.

அலகு 4 : எச்.ஏ. கிருஷ்ணப்பிள்ளை - இரட்சணிய யாத்திரீகம் போற்றித் திருவகவல்.

அலகு 5 : குணங்குடிமஸ்தான் - ரஹ்மான் கண்ணி

பார்வை நூல்கள்:

1. ஆ.வேலுப்பிள்ளை : தமிழில் சமய வரலாறு.

2. மு.இராகவையங்கார் : ஆழ்வார்கள் காலநிலை.

3. த.ஞானசுந்தரம் : வைணவ உரைவளம்.

4. மயிலை சீனி வேங்கடசாமி : சைவமும் தமிழும்.

5. மயிலை சீனி வேங்கடசாமி : வைணவமும் தமிழும்.

6. மயிலை சீனி வேங்கடசாமி : கிருத்துவமும் தமிழும்.

தாள் VII

17P2TA7 – தொல்காப்பியம் - எழுத்ததிகாரம் II

அலகு 1 : உருபியல்.

அலகு 2 : உயிர்மயங்கியல்.

அலகு 3 : புள்ளிமயங்கியல்.

அலகு 4 : குற்றியலுகரப் புணரியல் - I, நூற்பா 1 முதல் 38 வரை.

அலகு 5 : குற்றியலுகரப் புணரியல் - II, நூற்பா 39 முதல் 77 வரை.

பார்வை நூல்கள்:

1. மு. சண்முகம் பிள்ளை (ப.ஆ.) : தொல்காப்பியம் எழுத்ததிகாரம்,
184, பிராட்வே, முல்லை நிலையம்,
சென்னை - 600 108.

2. ச. வே. சுப்பிரமணியம் (ப.ஆ.) : தொல்காப்பியம் எழுத்ததிகாரம்,
(உரை வளங்கள்),
உலகத் தமிழாராய்ச்சி நிறுவனம்,
தரமணி, சென்னை - 600 113.

3. கு. சுந்தரமூர்த்தி : தொல்காப்பியம் எழுத்ததிகாரம்,
அண்ணாமலைப் பல்கலைக்கழகம்,
அண்ணாமலை நகர், 1986.

4. ஆ. சிவலிங்கனார் : தொல்காப்பிய உரைவளம்,
உலகத் தமிழாராய்ச்சி நிறுவனம்,
தரமணி, சென்னை - 600 113.

5. சூ. இன்னாசி : எழுத்தியல்,
184, பிராட்வே, பாரி நிலையம்,
சென்னை - 600 108.

தாள் VIII

17P2TA8 - தொல்காப்பியம் - சொல்லதிகாரம் I

அலகு 1 : கிளவியாக்கம்.

அலகு 2 : வேற்றுமையியல்.

அலகு 3 : வேற்றுமை மயங்கியல்.

அலகு 4 : விளிமரபு.

அலகு 5 : பெயரியல்.

பார்வை நூல்கள்:

1. மு. சண்முகம் பிள்ளை (எ.ஆ.) : தொல்காப்பியம் சொல்லதிகாரம்,
184, பிராட்வே, முல்லை நிலையம்,
சென்னை - 600 108.

2. ச.வே. சுப்பிரமணியம் : தொல்காப்பியம் எழுத்ததிகாரம், (உரை வளங்கள்),
உலகத் தமிழாராய்ச்சி நிறுவனம்,
தரமணி, சென்னை - 600 113.

3. கு. சுந்தரமூர்த்தி : தொல்காப்பியம் எழுத்ததிகாரம்,
அண்ணாமலைப் பல்கலைக்கழகம்,
அண்ணாமலை நகர், 1986.

4. செ.வை. சண்முகம் : சொல்லிலக்கணக் கோட்பாடு,
அனைத்திந்திய மொழியியற் கழகம்,
அண்ணாமலை நகர் - 608 021.

5. மோ. இசுரயேல் : பெயர்ச்சொல், இடைச்சொல், உரிச்சொல்,
வினைச்சொல்,
சர்வோதய இலக்கியப் பண்ணை,
மதுரை - 625 001.

6. ஆ. சிவலிங்கனார் : தொல்காப்பிய உரைவளம்,
உலகத் தமிழாராய்ச்சி நிறுவனம்,
தரமணி, சென்னை.

7. சு. சக்திவேல் : தமிழ் மொழி வரலாறு,
மணிவாசகர் பதிப்பகம், சென்னை.

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17P2HR - HUMAN RIGHTS

COMPULSORY PAPER

UNIT-I

Definition of Human Rights - Nature, Content, Legitimacy and Priority -Theories on Human Rights - Historical Development of Human Rights.

UNIT - II

International Human Rights - Prescription and Enforcement upto World War II - Human Rights and the U.N.O. - Universal Declaration of Human Rights -International! Covenant on Civil and Political Rights - International Convenant on Economic, Social and Cultural Rights and Optional Protocol.

UNIT - III

Human Rights Declarations - U.N. Human Rights Declarations - U.N. Human Commissioner.

UN1T - IV

Amnesty International - Human Rights and Helsinki Process - Regional Developments - European Human Rights System - African Human Rights System - International Human Rights in Domestic courts.

UNIT - V

Contemporary Issues on Human Rights: Children's Rights - Women's Rights - Dalit's Rights - Bonded Labour and Wages - Refugees - Capital Punishment.

Fundamental Rights in the Indian Constitution - Directive Principles of State Policy - Fundamental Duties - National Human Rights Commission.

விருப்பப்பாடம் II

தாள் II

17P2ETA - 2. பொது மொழியியல்

அலகு 1   :   மொழியியலும் மொழியியல் சார்ந்த விளக்கங்களும்

மொழி - வரையறை - விளக்கம் - மொழியியல் பற்றிய
சொல் பொருள் விளக்கம், மொழியியல் பிரிவுகள், மொழி -
பேச்சு மற்றும் எழுத்து முறைகள், மொழியின் கட்டமைப்பு.

அலகு 2   :   ஒலியியலும், ஒலியனியலும்

ஒலியியல் விளக்கம் - பிரிவுகள் - பேச்சு உறுப்புகள் - பேச்சொலி வகைப்பாடு
- இணையொலிப்பு, ஒலியனியல் - வரையறை - விளக்கம் - ஒலி - ஒலியன் -
மாற்றொலி, ஒலியன் கோட்பாடுகள் - மேற்கூற்றொலியன்.

அலகு 3   :   உருபனியல்

உருபனியல் - வரையறை - விளக்கம் - உருபன் - உருபு -
மாற்றுருபு - நைடாவின் உருபனைக் கண்டறியும் கொள்கைகள் -
உருபன் வகைகள் - உருபு வகைகள்.

அலகு 4   :   தொடரியல்

தொடரியல் - வரையறை - சொல் வகைகள் - அண்மையுறுப்பு -
விளக்கம் - அண்மையுறுப்பு வகைகள் - தொடரமைப்பு -
மாற்றிலக்கணக் கோட்பாடு - அகவடிவம், புறவடிவம்.

அலகு 5   :   பொருண்மையியல்

பொருள் வகைகள் - சொற்பொருள் மற்றும் இலக்கணப் பொருள்,
சொற்பொருள் அலகுகள் - சுட்டுப் பொருள், குறிப்புப் பொருள் -
ஒருபொருட் பன்மொழி - பல பொருள் குறித்த ஒரு சொல், ஒலியமைப்பியல்
ஒத்த பொருள் மாறுபடும் சொற்கள்.

பார்வை நூல்கள்:

1. முத்து சண்முகம் பிள்ளை : இக்கால இலக்கியம்
மதுரை பல்கலைக் கழகம்,
மதுரை. முதற்பதிப்பு - 1980.

2. சு. இராசாராம் : ஒலியியல்
இந்திய மொழிகளின் மத்திய நிறுவனம்,
மைசூர், முதற்பதிப்பு - 1981.

3. ச. அகத்தியலிங்கம் : மொழியியல் சொல்லியல் பெயரியல்,
அனைத்திந்திய தமிழ் மொழியியற்கழகம்,
அண்ணாமலை நகர்,
முதற்பதிப்பு - 1982.

4. கி. கருணாகரன். வ. ஜெயா : மொழியியல்
குமரன் பதிப்பகம்,
சென்னை. முதற்பதிப்பு - 1997.

5. கி. அரங்கன் : தொடரியல்: மாற்றிலக்கண அணுகுமுறை
தமிழ்ப் பல்கலைக்கழகம்,
தஞ்சாவூர், முதற்பதிப்பு - 1985.

6. கி. அரங்கன் : மாற்றிலக்கண மொழியியல்:
மாற்றிலக்கணமும் அதன் கோட்பாடுகளும்
இந்திய மொழிகளின் மைய நிறுவனம்,
மைசூர், முதற்பதிப்பு - 1975.

இரண்டாம் ஆண்டு

மூன்றாம் பருவம்

தாள் **IX**

17P3TA9 - சங்க இலக்கியம் I

அலகு 1 : அகநானூறு - களிற்றியானைநிரை 11 - 20 பாடல்கள்.

அலகு 2 : புறநானூறு - 1 - 20 பாடல்கள்.

அலகு 3 : நற்றிணை - 1 - 20 பாடல்கள்.

அலகு 4 : குறுந்தொகை - 1 - 20 பாடல்கள்.

அலகு 5 : கலித்தொகை — முல்லைக்கலி, 101 - 110 பாடல்கள்.

பார்வை நூல்கள்:

1. எஸ். வையாபுரிப்பிள்ளை (ப.ஆ.),: சங்க இலக்கியம்,
பாரி நிலையம், சென்னை,
2ஆம் பதிப்பு, 1967, விலை ரூ. 15/-

2. எஸ். வையாபுரிப்பிள்ளை : தமிழர் பண்பாடு,
தமிழ்ப்புத்தகாலயம், சென்னை - 5,
எட்டாம் பதிப்பு, 1974.

3. மு. வரதராசனார் : பழந்தமிழ் இலக்கியத்தில் இயற்கை,
கலைக்கதிர் வெளியீடு, கோயமுத்தூர்,
முதற்பதிப்பு, 1955.

4. வ.சுப. மாணிக்கனார் : தமிழ்க் காதல்,
பாரி நிலையம், சென்னை - 108,
3ஆம் பதிப்பு, 1980.

5. அரங்க. இராமலிங்கம் : சங்க இலக்கியத்தில் வேந்தர்,
பாரி புத்தக நிலையம், சென்னை - 17,
மூன்றாம் பதிப்பு, 2003, ரூ. 200/-

தாள் X

17P3TA10 - ஆராய்ச்சி நெறிமுறைகள்.

அலகு 1 : ஆராய்ச்சி : சொற்பொருள் விளக்கம் - ஆராய்ச்சிப் பொருள் - ஆய்வாளர்க்குரிய தகுதிகள் - ஆராய்ச்சி வகைகள் - அணுகுமுறைகள் - கருதுகோள் - ஆய்வுச்சிக்கல்கள்.

அலகு 2 : ஆய்வின் அடிப்படை நெறிமுறைகள் : ஆய்வுப் பொருளைத் தெளிவாகச் சுட்டல் - ஆய்வுப் பொருள் பற்றி இதுவரை செய்யப்பட்ட ஆய்வுகள் - ஆராயப்பட வேண்டியன - ஆராயப்பட வேண்டுவனவற்றுள் இப்போது எடுத்துக்கொள்ளப்பட வேண்டியன.

அலகு 3 : ஆய்வுலக அடிப்படைக் கோட்பாடுகள்: செய்திகள் (Facts) - கருத்துகள் - விதி (Law) - கொள்கை (Theory) - வகைப்பாடு (Classification) - கோட்பாடுகள் - அறிவியல் ஆய்வும் - கலையியல் ஆய்வும்.

அலகு 4 : ஆய்வேட்டின் அமைப்பும் வரைவு முறையும் : ஆய்வேட்டின் அமைப்பு - தகவல் திரட்டல் - திட்டமிடுதல் - ஆய்வு மொழிநடை - முதல் படி (First Draft) - திருத்தப்படி (Revised Draft) - அடிக்குறிப்பு (Footnote) - துணைநூற்பட்டியல் (Bibliography) - குறுக்க விளக்கம் - முன்னுரை - முடிவுரை - பரிந்துரை - படங்கள் - அட்டவணைகள் - பொருட்குறிப்பு அகராதி.

அலகு 5 : தமிழாய்வுப் பரப்பு - இலக்கிய ஆய்வு - ஒப்பிலக்கிய ஆய்வு - இலக்கிய வரலாற்று ஆய்வு - இலக்கண ஆய்வு - மொழி வரலாற்று ஆய்வு - அகராதி ஆய்வு - தமிழியலும் மொழியியலும் - தமிழியலும் பண்பாட்டியலும் - தமிழியலும் நுண்கலைகளும் - தமிழியலும் உளவியலும் - தமிழியலும் தொல்பொருள் ஆய்வும் - தமிழியலும் அகராதியியலும்.

பார்வை நூல்கள்:

1. டாக்டர் ச.வே.சுப்பிரமணியம் : (ப.ஆ.) ஆராய்ச்சி நெறிமுறைகள், உலகத் தமிழாராய்ச்சி நிறுவனம், தரமணி, சென்னை, 1975.

2. டாக்டர் ஈ.சா. விசுவநாதன் : ஆய்வு நெறிமுறைகள், தமிழ்ப்புத்தகாலயம், சென்னை, 1986.

3. டாக்டர் முத்துச்சண்முகம், டாக்டர் சு.வேங்கடராமன் : ஆய்வுக்கட்டுரை எழுதும் முறை, முத்துப் பதிப்பகம், மதுரை, 1979.

4. டாக்டர் பொற்கோ : ஆராய்ச்சி நெறிமுறைகள்,
ஐந்திணைப் பதிப்பகம்,
279, பாரதிசாலை, திருவல்லிக்கேணி,
சென்னை - 5, 2005.

5. டாக்டர் என். கணேசன் : ஆய்வியல் கோட்பாடுகளும் செயல்முறைகளும்,
பயோனியர் புக் சர்வீஸ்,
சென்னை - 5, 1991.

6. டாக்டர் வே. சிதம்பரநாதன் : ஆய்வியல் முறைகள்,
சுபா பதிப்பகம்,
நாகர்கோவில், 1987.

7. முனைவர்
கு.வெ. பாலசுப்பிரமணியன் : ஆய்வியல் நெறிகள்,
உமா நூல் வெளியீட்டகம்,
156, காமாட்சி அம்மன் கோயில் தெரு,
மருத்துவக்கல்லூரிச் சாலை,
தஞ்சாவூர் - 4, 2004.

தாள் XI

17P3TA11 - தொல்காப்பியம் சொல்லதிகாரம் II

அலகு 1 : வினையியல் - I, 1 முதல் 28 நூற்பாக்கள்.

அலகு 2 : வினையியல் - II, 29 முதல் 49 நூற்பாக்கள்.

அலகு 3 : இடையியல்.

அலகு 4 : உரியியல்.

அலகு 5 : எச்சவியல்.

பார்வை நூல்கள்:

1. மு. சண்முகம் பிள்ளை (எ.ஆ.), : தொல்காப்பியம் சொல்லதிகாரம்,
   184, பிராட்வே, முல்லை நிலையம்,
   சென்னை 600 108.

2. ச.வே.சுப்பிரமணியம் (ப.ஆ.) : தொல்காப்பியம் சொல்லதிகாரம்,
   உலகத் தமிழாராய்ச்சி நிறுவனம்,
   தரமணி, சென்னை 600 113.

3. கு. சுந்தரமூர்த்தி (எ.ஆ.), : தொல்காப்பியம் சொல்லதிகாரம்,
   அண்ணாமலைப் பல்கலைக்கழகம்,
   அண்ணாமலை நகர் - 608 002, 1986.

4. சூ. இன்னாசி : சொல்லியல்,
   தமிழரசன் பதிப்பகம்,
   பாளையங்கோட்டை.

5. பொன். கோதண்டராமன் : தமிழிலக்கணக் கோட்பாடுகள்,
   ஐந்திணைப் பதிப்பகம்,
   279, பாரதிசாலை, திருவல்லிக்கேணி,
   சென்னை - 600 005.

தாள் XII

17P3TA12 - தொல்காப்பியம் பொருளதிகாரம் I

அலகு 1 : அகத்திணையியல்.

அலகு 2 : புறத்திணையியல்.

அலகு 3 : களவியல்.

அலகு 4 : கற்பியல்.

அலகு 5 : பொருளியல்.

பார்வை நூல்கள்:

1. மு. சண்முகம் பிள்ளை : தொல்காப்பியம் பொருளதிகாரம்,
   184, பிராட்வே, முல்லை நிலையம்,
   சென்னை 600 108.

2. ச.வே. சுப்பிரமணியம் (ப.ஆ.) : தொல்காப்பியம் பொருளதிகாரம்,
   உலகத் தமிழாராய்ச்சி நிறுவனம்,
   தரமணி, சென்னை 600 113.

3. கு. சுந்தரமூர்த்தி (எ.ஆ.), : தொல்காப்பியம் பொருளதிகாரம்,
   அண்ணாமலைப் பல்கலைக்கழகம்,
   அண்ணாமலை நகர் - 608 002, 1986.

4. டாக்டர் க.ப. அறவாணன் : அற்றை நாள் காதலும் வீரமும்,
   தமிழ்கோட்டம், கஜபதி நாயுடு தெரு,
   அமைந்தகரை, சென்னை- 600 030, 1971.

5. மொ.த. துரை அரங்கனார் : தொல்காப்பிய நெறி

6. ஆ. சிவலிங்கனார் : தொல்காப்பிய உரைவளம்,
   உலகத் தமிழாராய்ச்சி நிறுவனம்,
   தரமணி, சென்னை 600 113, 1982.

விருப்பப்பாடம் III

தாள் III

17P3ETA - 3. பெரியாரியல்.

அலகு 1 : பெரியார் ஈ.வே.ரா. பிறப்பு — சமூகச்சூழல் - பொது வாழ்வியல் ஈடுபாடு - இராசாசி தொடர்பு — தமிழக அரசியல் நிலை — பேராயக் கட்சி ஈடுபாடு.

அலகு 2 : வைக்கம் அறப்போர் - சேரன் மாதேவி குருகுலப் போராட்டம் - கோயில் நுழைவுப்போராட்டம் - இட ஒதுக்கீடு சிக்கல் - பேராயக் கட்சியிலிருந்து விலகல் - குடி அரசு இதழ் தொடங்கல் - காந்தியடிகளுடன் மீண்டும் சந்திப்பு — நீதிக்கட்சி ஈடுபாடு.

அலகு 3 : சுயமரியாதை இயக்கத்தைத் தொடங்கல் - புரோகித ஒழிப்புத் திருமணத்தை அறிமுகப்படுத்துதல் - செங்கற்பட்டு — சுயமரியாதை முதல் மாநில மாநாடு - ஈரோடு சமதர்மத் திட்டம்.

அலகு 4 : தமிழ் மொழிக் காப்புப் போராட்டம் - நீதிக்கட்சி — பெயர் மாற்றம் - திராவிடர் இயக்கம்.

அலகு 5 : பெரியாரின் இதழியற் பணிகள் - பெரியாரின் கோட்பாடுகள் பெற்ற செயல் வடிவங்கள் - அரசு ஆணைகள்.

பார்வை நூல்கள்:

1. வே.ஆனைமுத்து (ப-ஆ)-பெரியார் ஈ.வே.ரா.சிந்தனைகள் தொகுதி.
2. கி.வீரமணி (தொ.ஆ) — பெரியார் சிந்தனைகள்.
3. மா.நன்னன் - பெரியாரியல்.
4. இரா.சக்குபாய் (ப.ஆ) — பெரியாரியம்.
5. சாமி.சிதம்பனார் - தமிழர் தலைவர்.
6. கி.வீரமணி — பெரியாரியம்.
7. பெரியார் (நாடகம்) — ஞானி.

இரண்டாம் ஆண்டு

நான்காம் பருவம்

தாள் XIII

17P4TA13 - சங்க இலக்கியம் II

அலகு 1 : திருமுருகாற்றுப்படை - முழுவதும்.

அலகு 2 : சிறுபாணாற்றுப்படை - முழுவதும்.

அலகு 3 : பட்டினப்பாலை - முழுவதும்.

அலகு 4 : முல்லைப்பாட்டு - முழுவதும்.

அலகு 5 : குறிஞ்சிப்பாட்டு - முழுவதும்.

பார்வை நூல்கள்:

1. சு. வித்தியானந்தன் : தமிழர் சால்பு,
பாரி புத்தகப் பண்ணை,
சென்னை, 2ஆம் பதிப்பு, 1971, ரூ.7.50/-

2. மா. இராசமாணிக்கனார் : பத்துப்பாட்டு ஆய்வு,
சர்வோதய இலக்கியப் பண்ணை,
மதுரை, முதற்பதிப்பு, 1981, ரூ.15/-

3. மா. இராசமாணிக்கனார் : தமிழ் இலக்கிய வரலாறு (சங்ககாலம்),
பாரி நிலையம், சென்னை - 108,
மூன்றாம் பதிப்பு, 1971

4. சைவ சித்தாந்த
நூற்பதிப்புக் கழகம் : சங்க இலக்கியச் சொற்பொழிவு வரிசைகள்

5. சு.செல்லப்பன் : சங்க இலக்கியத் தேன் (மூன்று தொகுதிகள்)

தாள் XIV

17P4TA14 - சிற்றிலக்கியம்

அலகு 1 : நந்திக்கலம்பகம் - முழுவதும்.

அலகு 2 : தமிழ்விடு தூது – முழுவதும்.

அலகு 3 : கலிங்கத்துப்பரணி – களம் பாடியது, போர் பாடியது.

அலகு 4 : திருச்செந்தூர் பிள்ளைத் தமிழ் – பகழிக்கூத்தர்.

அலகு 5 : முக்கூடற்பள்ளு - முழுவதும்.

பரிந்துரை நூல்கள்.

1. செயங்கொண்டார், கலிங்கத்துப் பரணி முதற் பதிப்பு, 1998, உமா பதிப்பகம்.சென்னை.
2. தமிழ்விடு தூது, முதல் பதிப்பு, 2000, மகாராணி, சென்னை -600 101.
3. முக்கூடற்பள்ளு, மறு பதிப்பு, 2004,பாரிநிலையம், சென்னை -600 108.
4. திருமுருகன் பிள்ளைத் தமிழ், பாரிநிலையம், சென்னை -600 108.
5. நந்திக் கலம்பகம், பாரிநிலையம், சென்னை – 600 108.

பார்வை நூல்கள்:

1. முத்துச்சண்முகம்,
   நிர்மலா மோகன் : சிற்றிலக்கியங்களின் தோற்றமும் வளர்ச்சியும்,

2. ந.வீ. ஜெயராமன் : சிற்றிலக்கியச் செல்வம்,
   மணிவாசகர் பதிப்பகம்,
   சென்னை, 1969

3. மு.சண்முகம்பிள்ளை : சிற்றிலக்கிய வளர்ச்சி.

4. மு.சண்முகம்பிள்ளை : சிற்றிலக்கிய வகைகள்.

5. சிலம்பு ந.செல்வரசு : இருபதாம் நூற்றாண்டுச் சிற்றிலக்கியங்கள்.

6. கழகம் : சிற்றிலக்கியச் சொற்பொழிவுகள்.

தாள் XV

17P4TA15 - தொல்காப்பியம் - பொருளதிகாரம் II

அலகு 1 : மெய்ப்பாட்டியல்.

அலகு 2 : உவமயியல்.

அலகு 3 : மரபியல்.

அலகு 4 : செய்யுளியல் - I நூற்பா 1 முதல் 118 வரை.

அலகு 5 : செய்யுளியல் - II நூற்பா 119 முதல் 235 வரை.

பார்வை நூல்கள்:

1. மு. சண்முகம் பிள்ளை : தொல்காப்பியம் பொருளதிகாரம்,
   184, பிராட்வே, முல்லை நிலையம்,
   சென்னை - 600 108

2. ச.வே. சுப்பிரமணியம் (ப.ஆ.) : தொல்காப்பியம் பொருளதிகாரம் (உரை வளங்கள்),
   உலகத் தமிழாராய்ச்சி நிறுவனம்,
   தரமணி, சென்னை - 600 113

3. கு. சுந்தரமூர்த்தி (எ.ஆ.) : தொல்காப்பியம் பொருளதிகாரம்,
   அண்ணாமலைப் பல்கலைக்கழகம்,
   அண்ணாமலை நகர் - 608 002, 1986

4. ஆ. சிவலிங்கனார் : தொல்காப்பியம் உரைவளம்,
   உலகத் தமிழாராய்ச்சி நிறுவனம்,
   தரமணி, சென்னை - 600 113

5. வ.சுப. மாணிக்கம் : தொல்காப்பியத் திறன்,
   மணிவாசகர் பதிப்பகம்,
   31, சிங்கர் தெரு, பாரிமுனை,
   சென்னை - 600 108

தாள் IV

17P4TA16 - திருவள்ளுவர்

அலகு 1 : அறத்துப்பால்: அறம் - சொல்லும், பொருளும் - அறத்தின் அளவீடு - அறத்தின் வரையறை - திருக்குறளின் அறம் - வள்ளுவரின் அறங்கூறுந்திறன்.

அலகு 2 : இல்லறவியல் - இல்லறத்தார் இயல்புகள் நல்லறம் நாடல் - தீயறம் விடல்.

துறவறவியல் - துறந்தார் இயல்புகள் மெய்மைத் துறவு - துறத்தலின் நன்மைகள்.

அலகு 3 : பொருட்பால் - அங்கவியல் - மனிதத்திறன் அறிதல் - மனிதத்திறனைப் பயன்படுத்துதல் - நுட்பம் அறிதல் - தீமை - ஒழித்தல் - மேன்மை பெறுதல்.

அலகு 4 : ஒழிபியல் - வாழ்வில் உயர உதவுதல், சமுதாய நலன் - தன்னிலைப் பெறுதல்.

அலகு 5 : இன்பத்துப்பால் - வள்ளுவர் வகுத்த களவியல் - கற்பியல் நெறிகள், ஒருவரை ஒருவர் உணரும் அன்பு முதலியன.

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திருவண்ணாமலை மாவட்டம்

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விருப்பப்பாடம் IV

தாள் IV

17P4ETA 4. சங்ககாலம்.

அலகு 1 : முச்சங்கம் - சங்கம் இருந்தமை பற்றிய சான்றுகள் - அகச்சான்று - சங்க இலக்கியங்கள், பிற்கால இலக்கியங்கள் - சங்கம் பற்றிய குறிப்புகள் - சங்கப் புலவர்களும் சங்கமிருந்த இடங்களும் - மரபுவழி

அலகு 2 : கால ஆராய்ச்சி - அசோகர் கல்வெட்டு, பிற்காலச் செப்பேடு, அகழ்வு ஆய்வுக் குறிப்புகள், இலக்கிய வரலாறு, தமிழக வரலாறு வழி அறியவரும் செய்திகள், சங்க இலக்கியத்தின் ஒத்த காலத்திய பிற நாட்டினர் குறிப்பு - சமய நூல்களில் காணப்படும் தமிழகம் பற்றிய குறிப்பு - யவணர் பயணக் குறிப்பு - கிரேக்க நாட்டுடன் தொடர்பு - உரோம நாட்டுடன் தொடர்பு - வட நாட்டுடன் தொடர்பு - மதுரையில் உரோமர் குடியிருப்பு - சங்க இலக்கியங்களில் பிற மொழிகளின் சொற்கள் - பயண்பாட்டுக் கலப்பு - இலக்கியக் கோட்பாடு - கடற்செலவு - மேனாட்டுடன் வணிகம் - வணிகத் தொடர்பான பட்டினங்கள் - கொற்கை, தொண்டி, முசிறி முதலியன

அலகு 3 : தொல்காப்பியம் - கால ஆராய்ச்சி - தொல்காப்பியம் உணர்த்தும் - இலக்கியக் கோட்பாடுகள், இலக்கிய வகைகள் - மரபுகள் - புதுமைகள் - மொழியியல் - கருத்துகள் - தொல்காப்பியத்தைத் திருக்குறளுடனும் சங்க இலக்கியங்களுடனும் ஒப்பிடல் - தொடர்புச் செல்வாக்கு, மரபு முதலானவற்றைக் காட்டும் வாழ்க்கை - களவு, கற்பு, தொழில், சமயம், அரசியல், போர் நெறி முதலியன.

அலகு 4 : மக்கள் வாழ்க்கை முறை - இல்லறம் - துறவறம் - தனிநிலை ஆண்மை - பெண்மைப் பண்பும் கடமையும் - சிற்றூர் வாழ்க்கை - புறநகர வாழ்க்கை - சமுதாயப் பாகுபாடுகள் - தொழில் வாணிகம் - பல்வகைக் கலைகள் - கைவினைப் பொருள்கள் - திணைவழி வாழ்வு - பொருளாதாரம் - சாதி - உணவுமுறை - உடைகள் - அணிகள் - கடவுள் கொள்கை - முருகன், திருமால், கொற்றவை, வருணன், வேந்தன் - வழிபாட்டு முறைகள் - திருவிழாக்கள், நம்பிக்கைகள், சடங்குகள்.

அலகு 5 : சங்க இலக்கியத்தில் பல்துறை அறிவு - உளவியல் - பயிரியல் - விலங்கியல் - அறிவியல் - திறனாய்வு இயல் - மருத்துவ இயல் முதலியவை - சங்க நூல்கள் அக்காலத்திற்குப் பின் தோன்றிய நூல்களிலிருந்து வேறுபட்டவையா, சிறப்புகள் என்ன? சங்கத் தாக்கம் பிற்கால நூல்களில் அமைந்துள்ள பாங்கு.

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M.A. தமிழ் - பருவ முறை

வினாப் பகிர்வு

மொத்த மதிப்பெண் - 75

அலகு வரிசை	பகுதி – 1		பகுதி – 2	
	வினா எண்ணிக்கை	மதிப்பெண்	வினா எண்ணிக்கை	மதிப்பெண்
அலகு 1	2 A (அ) B	1 x 6 = 6	1	1 x 15 = 15
அலகு 2	2 A (அ) B	1 x 6 = 6	1	1 x 15 = 15
அலகு 3	2 A (அ) B	1 x 6 = 6	1	1 x 15 = 15
அலகு 4	2 A (அ) B	1 x 6 = 6	1	1 x 15 = 15
அலகு 5	2 A (அ) B	1 x 6 = 6	1	1 x 15 = 15
		5 x 6 = 30		**3 x 15 = 45**

(பகுதி 1 = 30) + (பகுதி 2 = 45) = 75

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MUTHURANGAM GOVERNMENT ARTS COLLEGE

(AUTONOMOUS)

VELLORE - 632002

MASTER OF PHILOSOPHY

M.Phil TAMIL (FULL TIME & PART TIME)

SYLLABUS

UNDER CBCS

(with effect from 2017-2018)

MUTHURANGAM GOVERNMENT ARTS COLLEGE(AUTONOMOUS)

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DEGREE COURSE

SYLLABUS

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(with effect from 2017-2018)

The course of study and the scheme of examinations

Seme ster	Subject	Paper	Subject code	Title of the Paper	Credit	Exam Hrs	Max. Marks		Total
							IA	Univ Exam	
I SEM	Core Theory-I	1	17MTA1	ஆராய்ச்சி நெறிமுறைகள்	5	3	25	75	100
	Core Theory-II	2	17MTA2	தமிழ் ஆராய்ச்சி வரலாறு	5	3	25	75	100
	Guide Paper Elective-1	1	17ME-TA1	தமிழர் நாகரிகமும் பண்பாடும்	5	3	25	75	100
II SEM	Dissertation and Viva-Voce	1	17MTAD	ஆய்வுத் தலைப்பு (Title of the dissertation)	21	-	-	-	100
					36	09	75	225	400

17MTA1 - ஆராய்ச்சி நெறிமுறைகள்

அலகு-1 : ஆய்வியல் - அறிமுகம் - ஆய்வின் இலக்கணம் - ஆய்வுப் பொருள் - ஆய்வாளர் பண்புகள் - ஆய்வு முறைகள் - தலைப்புத் தேர்வுகள் - தலைப்புப் பண்புகள் - உத்திகள் - வகைகள் - உள்ளடக்கம் - வகை - வகைமை.

அலகு-2 : ஆய்வுத்திட்டமிடல் - கருதுகோள்கள் - செய்திகள் - கொள்கை — வகைகள் - ஆய்வின் வகைப்பாடுகள் - கோட்பாட்டாய்வு — வகைப்படுத்துதல் ஆய்வு — பொருத்திக்காட்டல் ஆய்வு — அணுகுமுறை.

அலகு-3 : ஆய்வு நெறிமுறைகள் - தகவல் திரட்டுதல் - தரவு திரட்டுவதற்குரிய மூலங்களைக் கண்டறிதல் - தரவுகளைத் தொகுத்தல் - குறிப்பெடுக்கும் முறை — வகைப்படுத்தும் முறை — அடிக்குறிப்பு — மேற்கோளாட்சி — நேர்காணல் - வினாநிரல் - கள ஆய்வு.

அலகு-4 : ஆய்வேட்டின் அமைப்பும் வரைவுமுறையும் - திட்டமிடுதல் - இயல் வகுத்தல் - உட்பிரிவுகள் - முன்னுரை — முடிவுரை — ஆய்வு மொழிநடை — நிறுத்தக் குறியாட்டு ஆட்சி — பிழையின்மை — எளிமை — தெளிவு — மேடைப்பேச்சு நடைமுறை விலக்கல் - சொல்லடுக்கு பொருளடுக்குகளை விலக்கல் - குறுக்க விளக்கம் - துணைநூற் பட்டியல் - பின்னிணைப்புகள் - படங்கள் - அட்டவணைகள் - பொருட்குறிப்பு — அகராதி.

அலகு-5 : தமிழாய்வுப் பரப்பு - இலக்கிய ஆய்வு — ஒப்பிலக்கிய ஆய்வு - இலக்கிய வரலாற்று ஆய்வு — நாட்டுப்புறவியல் ஆய்வு - இலக்கண ஆய்வு — மொழி வரலாற்று ஆய்வு — அகராதி ஆக்கம் - தமிழியலும் மொழியலும் - தமிழியலும் தத்துவமும் - தமிழியலும் பண்பாட்டியலும் - தமிழியலும் நுண்கலைகளும் - தமிழியலும் தொல்பொருள் ஆய்வியலும்.

பார்வை நூல்கள்:

1. ஆய்வியல் அறிமுகம் - டாக்டர் தமிழண்ணல்,

   டாக்டர் இலக்குமணன்,

   முனாட்சி நிலையம் ,

   மதுரை — 1977.

2. ஆராய்ச்சி நெறிமுறைகள் - டாக்டர் ச.வே. சுப்பிரமணியன்(ப.ஆ.,),

   உலகத் தமிழாராய்ச்சி நிறுவனம் ,

   சென்னை — 1975.

3. ஆய்வு நெறிமுறைகள் - டாக்டர் ஈ.சா. விசுவநாதன் ,

   சென்னை — 1975.

4. இலக்கிய ஆராய்ச்சி நெறிமுறைகள் - டாக்டர் முத்துச் சண்முகம்,

   டாக்டர் சு. வேங்கடராமன் ,

   முத்துப் பதிப்பகம் ,

   மதுரை — 1975.

5. ஆராய்ச்சி நெறிமுறைகள் - டாக்டர் பொற்கோ,

   ஐந்திணைப் பதிப்பகம் ,

   திருவல்லிக்கேணி,

   சென்னை — 1995.

17MTA2 - தமிழ் ஆராய்ச்சி வரலாறு

அலகு -1 : தமிழியல் ஆராய்ச்சி வரலாறு - அறிமுகம் - மறைந்துபோன நூற்கள் - வெளிவந்துள்ள தமிழியல் ஆராய்ச்சி குறித்த நூல்கள் - மரபுவழிபட்ட தமிழியல் ஆய்வு - தொல்காப்பியக் காலத்திற்கு முற்பட்ட ஆய்வு - தொல்காப்பியக்கால ஆய்வு.

அலகு -2 : சங்ககால ஆய்வுகள் - இலக்கிய உருவாக்கம் - தொகுப்பு முறைகள் உருவாக்கம் - திருவள்ளுவரும் அவருக்கு முற்பட்ட பிற்பட்ட நூதி நூல்கள் உருவாக்கம் - சமய நூல்கள் உருவாக்கம் - சூழல் - மத செல்வாக்கும் தமிழியல் தொடர்பான இலக்கண இலக்கிய உருவாக்க வரலாறும் - கால ஆய்வு.

அலகு -3 : காப்பியங்கள் - காப்பிய உருவாக்கம் - இளங்கோ அடிகளும் அவருக்கு முற்பட்ட, பிற்பட்ட காப்பிய படைப்பு வரலாறு — ஆய்வுகள் - சிறுகாப்பிய அமைப்புகள் - சமய செல்வாக்கு — சமய ஆய்வு — கால ஆய்வு.

அலகு -4 : உரைநூல்கள் உருவாக்கம் - இலக்கண - இலக்கிய உரைநூற்கள் - உரையாசிரியர்கள் ஆய்வுமுறை சிந்தனைகண்டு முட்டுருவாக்கம் செய்தல் - ஒப்புமைப் பகுதிகளைக் கண்டுகூறுதல் - அகராதிகள் நிகண்டுகள் உருவாக்கம் - சிற்றிலக்கிய முட்டுருவாக்கம் - சிற்றிலக்கிய ஆய்வுகள் - கால ஆய்வு.

அலகு -5 : இக்காலத் தமிழியல் ஆய்வு — புனைகதை ஆய்வுகள் (நாவல் சிறுகதை) — கவிதை ஆய்வுகள் - நாடக ஆய்வுகள் - நாட்டுப்புறவியல் ஆய்வுகள் - மொழியியல் ஆய்வுகள் - 20 ஆம் நூற்றாண்டில் உருவான புதிய கருத்தோட்டங்கள் வழி உருப்பெற்ற ஆய்வுகள் - நிறுவனமயப்பட்ட ஆய்வுகள் - தமிழ் இலக்கிய ஆய்வுகள் - கால ஆய்வு.

பார்வை நூல்கள்:

1. தொல்காப்பிய ஆராய்ச்சி - பேரா. சி. இலக்குவனார் , வள்ளுவர் பதிப்பகம் , புதுக்கோட்டை — 1991.

2. தொல்காப்பியக் கடல் - டாக்டர் வ.சுப. மாணிக்கம் , மணிவாசகர் பதிப்பகம், சிதம்பரம் - 2002.

3. தமிழ் ஆராய்ச்சியின் வளர்ச்சி - ஏ.வி. சுப்பிரமணி அய்யர் , அமுத நிலையம் பிரைவேட் லிட், சென்னை — 1959.

4. இலக்கணச் சிந்தனைகள் - எஸ். வையாபுரிப் பிள்ளை, பாரி நிலையம், சென்னை — 1956.

5. தற்காலத் தமிழ்இலக்கியம் - ஏ.வி. சுப்பிரமணி அய்யர், மக்கள் வெளியீடு, சென்னை.

6. தற்காலத் தமிழ்இலக்கியம் - டாக்டர். ரா. தண்டாயுதம் , தமிழ்ப் புத்தகாலயம், சென்னை — 1973.

7. தமிழ் உரைநடை - மு. அருணாசலம் , தினமணி வெளியீடு.

8. இலக்கண வரலாறு - ஆ. வேலுப்பிள்ளை.

9. தொகுப்புக்கலை - சுந்தர சண்முகனார்.

10. உரையாசிரியர்கள் - மு. வை. அரவிந்தன்.

11. பண்டைத் தமிழர்வாழ்வும் வழிபாடும் - க. கைலாசபதி.

12. தமிழ் அகராதிக்கலையின் வளர்ச்சி வரலாறு — வ. ஜெயதேவன்.

13. பாட்டியல் நூல்கள் - சு. அரங்கராசன்.

14. காவியகாலம் - எஸ். வையாபுரிப் பிள்ளை.

15. பக்திஇலக்கியம் - ப. அருணாசலம்.

17ME-TA1- தமிழர் நாகரிகமும் பண்பாடும்

அலகு-1 : நாகரிகமும் பண்பாடும் - சங்க காலத்து அரசியல் நிலை - சங்க காலப் போர் முறை - சங்க காலத் தொழிற்பிரிவினரும் சமூக அமைப்பும் - பண்டைத் தமிழரின் திருமண முறை - குடும்ப வாழ்வு பற்றிய தமிழர் கொள்கை - தமிழ்நாட்டு வணிக வளம் - பண்டைத் தமிழரின் உணவு, உடை, உறையுள் - இறப்பு, ஈமச்சடங்கு நடுகல், தென்புலத்தார்கடன்.

அலகு-2 : பண்டைத் தமிழரின் கல்வி நிலை - பண்டைத் தமிழரின் வானியல் அறிவு - பண்டைத் தமிழரின் விளையாட்டும் பொழுதுபோக்கும் - சங்கத் தமிழரின் சமய வாழ்வு - ஆரிய வேள்வி நெறி - சங்க கால விழாக்கள் - சங்கப் புலவர் பண்பாடு - பழந்தமிழரின் நம்பிக்கைகள் - தமிழர் கண்ட நல்லறம்.

அலகு-3 :இசைக்கலையின் வரலாறு - தமிழகச் சிற்பக்கலை - தில்லைக் கூத்தனின் திருநடனம் - தமிழகக்கோயில் கட்டிடக்கலை வளர்ச்சி - ஓவியக்கலை - கூத்துக்கலை - மருத்துவக்கலை - நாடகக்கலை.

அலகு-4 : சைவ சமயம் - தமிழ்ப் பண்பாட்டில் வைணவம் - தமிழ்ப் பண்பாட்டில் சமணம் - தமிழ்ப் பண்பாட்டில் பௌத்தம் - தமிழ்ப் பண்பாட்டில் இசுலாம் சமயம் - நீதித்துறையின் வரலாறு - இடைக்காலக் கோயில்களின் பணிகள் - தமிழ்நாட்டரசியலில் வரிகள் - தமிழகக் காசுகளின் வரலாறு - உள்ளாட்சி மன்றங்களின் வரலாறு - இடைக்காலத் தொழிற் சங்கங்கள்.

அலகு-5 : சங்ககாலத்திற்குப்பின் சாதிகளின் வளர்ச்சி - சாதியொழிப்பு முயற்சிகள் - மகளிர் நிலை - மார்க்கோபோலோ கண்ட பாண்டிய நாட்டு நிலை -இந்திய நாகரிகத்தில் தமிழ்ப் பண்பாட்டுக் கூறுகள் - தமிழ்ப் பண்பாட்டில் ஆங்கில ஆட்சியின் செல்வாக்கு - மராட்டியர் செய்த நன்மைகள் - வாய்மொழிஇலக்கியங்களும் தமிழ்ப் பண்பாடும் - பழமொழியும் பண்பாடும் - சமயப் பொதுநோக்கு - பண்பாட்டு ஊடாட்டம்.

பார்வை நூல்கள்:

1. தமிழர் நாகரிகமும் பண்பாடும் - டாக்டர் அ. தட்சிணாமூர்த்தி.

2. தமிழர் பண்பாடும் அதன் சிறப்பியல்புகளும் - தனிநாயகம் அடிகள்.

3. தமிழர் வரலாறும் பண்பாடும் - சி. மௌனகுரு.

4. தமிழ்ப் பண்பாடு - முனைவர் த.அருள்பத்மராசன்.

5. தமிழக வரலாறும் மக்களும் பண்பாடும் - டாக்டர் கே.கே. பிள்ளை.

6. தமிழர் நாகரிகமும் பண்பாடும் - டாக்டர் மா.ரா. ராசமாணிக்கனார்.

7. எட்டுத்தொகையும் தமிழர் பண்பாடும் - சாமி . சிதம்பரனார்.

8. பத்துப்பாட்டும் தமிழர் பண்பாடும் - சாமி . சிதம்பரனார்.

9. தமிழர் வாழ்வியல் - டாக்டர் சி.இலக்குவனார்.

10. சங்ககாலத் தமிழர் வாழ்வு - லெ.ப. கரு. ராமநாதன் செட்டியார்.

11. தமிழர் நாகரிகமும் பண்பாடும் - ஞா. தேவநேயன்.

12. சமுதாயமும் பண்பாடும் - அ.மு. பரமசிவானந்தம்.

13. தமிழக வரலாறும் பண்பாடும் - வே.தி. செல்லம்.

14. தமிழர் சால்பு - டாக்டர் சு. வித்தியாநந்தன்.

M.Phil. தமிழ் - பருவ முறை
வினா பகிர்வு

மொத்த மதிப்பெண் : 75

அலகு வரிசை	பகுதி - 1		பகுதி - 2	
	வினா எண்ணிக்கை	மதிப்பெண்	வினா எண்ணிக்கை	மதிப்பெண்
அலகு 1	2 A (அ) B	1 x 6 = 6	1	1x15=15
அலகு 2	2 A (அ) B	1 x 6 = 6	1	1x15=15
அலகு 3	2 A (அ) B	1 x 6 = 6	1	1x15=15
அலகு 4	2 A (அ) B	1 x 6 = 6	1	1x15=15
அலகு 5	2 A (அ) B	1 x 6 = 6	1	1x15=15
		5 x 6 = 30		3x15=45

(பகுதி - 1 = 30) - (பகுதி - 2 = 45) = 75

MUTHURANGAM GOVERNMENT ARTS COLLEGE

(AUTONOMOUS)

VELLORE – 632 002.

FOUNDATION TAMIL

Syllabus

DEGREE COURSE

CBCS PATTERN

First Year & Second Year

With effect from 2017-2018

பருவமுறை

CBCS

(SEMESTER - PATTERN)

(2017-2018 ஆம் கல்வியாண்டு முதல்)

முத்துரங்கம் அரசினர் கலைக் கல்லூரி

(தன்னாட்சி)

வேலூர் - 632 002

பாடத்திட்டம்

அடித்தளப் படிப்பு

பகுதி - 1 தமிழ்.

இளங்கலை, இளம் அறிவியல், இளம் வணிகவியல்,
இளம் வணிக நிர்வாகவியல்

(பி.ஏ., பி.எஸ்சி., பி.காம்., பி.பி.ஏ., பட்டப்படிப்புகளுக்கு)

முதல் ஆண்டு

பருவமுறை

CBCS

(SEMESTER - PATTERN)

<div align="center">

(2017 ஜுன் முதல்)

முதற்பருவம் - தாள் - 1   17U1FT1
(FIRST SEMESTER) (CREDIT -3)

</div>

அலகு I. செய்யுள்

1. நாட்டு வணக்கம் - பாரதியார்.

2. பட்டணம் - பாரதிதாசன்.

3. மங்கையர் - தேசிய விநாயகம் பிள்ளை.

4. கத்தியின்றி இரத்தமின்றி – தமிழன் இதயம்.

<div align="right">நாமக்கல்.வெ.இராமலிங்கம் பிள்ளை.</div>

அலகு II.   செய்யுள்

1. தாயும் சேயும் - கண்ணதாசன்.

2. இன்பம் - கா.மு.ஷெரிப்.

3. சென்னிமலை கிளியோப்பட்ராக்கள் - ஈரோடு தமிழன்பன்.

4. வைகறை வரும் - மு. மேத்தா.

அலகு III.   இலக்கிய வரலாறு

1. கி.பி. 20 ஆம் நூற்றாண்டுக் கவிஞர்கள்.
2. நாடகம்.
3. ˙ புதினம்.
4. சிறுகதை.
5. உரைநடை.
6. புதுக்கவிதை.

அலகு IV. அ.   இலக்கணம்

1. எழுத்து பற்றிய விளக்கம்.

2. முதலெழுத்துக்கள், சார்பெழுத்துக்கள்.

3. சுட்டெழுத்துக்கள், வினாவெழுத்துக்கள்.

4. மொழி முதல் எழுத்துக்கள், மொழி இறுதி எழுத்துக்கள்.

5. கிரந்த எழுத்துக்கள்.

6. வல்லினம் மிகும், மிகா இடங்கள்.

<div align="center">3</div>

ஆ. ஒலிப்பு மாறுபாடுகளும் பொருள் வேறுபாடுகளும்

1. ண, ன வேறுபாடுகள்.

2. ர, ற வேறுபாடுகள்.

3. ல, ள, ழ வேறுபாடுகள்.

அலகு V. 1.மொழித்திறன்

1. கலைச்சொல்லாக்கம்.

2. நேர்காணல்.

3. பொருந்திய சொல் தருதல்.

4. மரபுத்தொடர்.

2. மொழிப்பெயர்ப்பு

தமிழ் - அடித்தளப்படிப்பு - தாள் - 1

வினாத்தாள் அமைப்புமுறை - வினாக்கள் பகிர்வு

பருவமுறை (SEMESTER PATTERN)

முதற்பருவம் 17U1FT1)

பாடம்	பகுதி அ	பகுதி ஆ	பகுதி இ
செய்யுள் I	2	2	1
செய்யுள் I I	2	2	1
இலக்கிய வரலாறு	2	2	1
இலக்கணம்	2	2	1
மொழித்திறன்	2	2	1
மொத்தம்	10	10	5

இரண்டாம் பருவம் - தாள் - 2 தமிழ்   17U2FT2
(SECOND SEMESTER) (CREDIT -3)

அலகு I. செய்யுள்

1. **திருநாவுக்கரசர், தேவாரம்** - நான்காம் திருமுறை - நமச்சிவாயத் திருப்பதிகம் 10 பாடல்கள் (சொல்துணை வேதியன் முதல் மாப்பிணை தழுவிய மாது ஓர் பாகத்தன் முடியும் வரை)

2. **குலசேகர ஆழ்வார், பெருமாள் திருமொழி** - ஆலைநீள் கரும்பனவன் எனத் தொடங்கும் பாடல் (தேவகி புலம்பல்) முழுமையும்.

3. **நளவெண்பா கலி நீங்கு காண்டம்** - தமயந்தி நளனைத் தேடப் புரோகிதனை விடுத்தது என்னை இருங்... கார் இருளில்... எனத் தொடங்கும் பாடல்கள், புரோகிதன் அயோத்தி அடைதல் - மின் நாடும் - எனும் பாடல், புரோகிதன் கூறிய மொழி கேட்டு நளன் கூறிய மறுமொழி - கானகத்து, ஒண்தொடி... பாடல்கள் தமயந்தி வந்த புரோகிதனை வினாவியது, எங்கண்.., வாக்கினான் எனும் பாடல்கள், புரோகிதன் மறுமொழி - வாக்கினான் எனும் பாடல். தமயந்தி இரண்டாம் சுயம்வரச் செய்தி அறிவிக்கச் செய்தது மீண்டும் எனும் பாடல். நளன் அது கேட்டு கூறியது. குறையாத... எனும் பாடல் இருதுபன்னன் கூறிய சமாதானம். என்மேல்... எனும் பாடல் நளனது தயக்கம் முன்னை... எனும் பாடல். நளன் இருதுபன்னனுக்கு தேரோட்டிச் செல்ல உடன்பட்டது. காவலனுக்கு... எனும் பாடல். நளன் தேர் ஓட்டிய சிறப்பு முந்தை... மேலாடை... எனும் பாடல்கள். கலி நளனை விட்டு நீங்கியது வண்டு... எனும் பாடல். இருதுபன்னன் குண்டினபுரியை அடைந்தது. ஆமை முதுகில்... எனும் பாடல். இருதுபன்னன் வீமராசனுக்குத் தன் வரவு அறிவித்தது. வெற்றித்... எனும் பாடல். வீமராசன் இருதுபன்னனை வினாவியது. கன்னி... எனும் பாடல். இருதுபன்னனது மறுமொழி. இன்று... எனும் பாடல். நளன் மடைவாயில் புக்கது. ஆதி... எனும் பாடல். தமயந்தி நளன் செய்யும் மடைத் தொழிலை அறிந்து வரச் செய்தது. இடைச்சுரத்தில்... எனும் பாடல். தமயந்தி தன் மக்களை நளன்பால் விடுத்தது. கோதை... எனும் பாடல். தன் மக்களைக் கண்ட நளன் அவர்களோடு உரையாடியது. மக்களை... எனும் பாடல். மன்னன்... ஆங்கு... உங்கள்... நெஞ்சில்... எந்தை... மன்னர்... எனும் பாடல்கள். செய்தி கேட்ட தமயந்தியின் துயரம். கொற்றக்... எனும் பாடல். உள்ள நிலையைத் தமயந்தி வீமனுக்கு அறிவித்தது. மற்று இத்திரு... எனும் பாடல். வீமராசன் நளனைத் தோற்றத்தால் அறிய முடியாது பேச்சினால் அறிந்தது. போது அலரும்... செவ்வாய்... எனும் பாடல்கள். வீமராசன் நளனைத் தன் உருக்காட்ட வேண்டியது. பைந்தலைய... எனும் பாடல். நளன் கார்க்கோடகன் தந்த ஆடையால் சுய உரு பெறுதல். அரவு அரசன்...

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மிக்கோன்... எனும் பாடல். நளன் மக்கள், நளனைச் சுயவடிவில் காணுதல், தாதையை முன்... எனும் பாடல். தமயந்தி நளனடியில் வீழ்ந்து வணங்கியது. பாதித்... எனும் பாடல். வானவர் நளனை வாழ்த்துதல். உத்தமரின்... எனும் பாடல்.

4. **நந்திக் கலம்பகம்** - திருவின் செம்மையும், சிவனை முழுவதும், அன்னையரும், தோழியரும், ஓடுகின்ற மேகங்கள், வானுறுமதியை என்று தொடங்கும் ஐந்து பாடல்கள்.

அலகு II.செய்யுள்

1. **சீறாப்புராணம், உறுமப்புலவர்** - மானுக்குப் பிணை நின்ற படலம். குயின் நிழல்... அரி இனம்... கொன்றையும், வானந்திரி, காலினல், குறுவெயர்ப்பு, குழை குழைத்து, அருள்வுடை, நெடியவன், பொருப்பிடைத், இடைநிலத்து, கொடிஅடம்பு, கதிர்விரி, குலத்தொடும், ஏடு அலர், நிறைவளம் வல்லவன், என் உயிர், இரு நிலத்து, தனியன், உன் உயிர் அத்திசைக்கு, கூடிய தூறும், அடவியல், வலையிடத்து, திருக்கற, கவைமுனைக், கட்டடன், என இவை. இச்சிலை, கலை எனை, அடவியியல், வரிப்புலி, ஒல்லையில், பிடிபடும், கோட்டுடை, தேங்கிய, மன்னிய, விடுத்திரேல், மான்உரை, பிரியம், முன்உடைக், பெருத்தமான், கான்இடைப், என்னூறு, காரணக், கள்ளமும், வேட்டுவன், இருந்து, வெண்ணிலாக், மலைவு, கன்றது, பிணை என, மாறுகொண்டவர், இணைத்து, என் உயிர், சிறப்புடைக் நதியிடைப், ஈதுஎலாம், இனத்தினை, மாதவம், இறைவன், குருளையும், அன்னது, மாடுறைந்து எனத் தொடங்கும் பாடல்கள்.

2. **முத்தொள்ளாயிரம் - பாண்டியன்** - பார்படுப, நேமிநிமிர் தோள், கார் நறு நீலம் என்று தொடங்கும் மூன்று பாடல்கள்.

   சோழர் - கொடி மதில், முடித்தலை அந்தணர் ஆவொடு என்று தொடங்கும் மூன்று பாடல்கள்.

   சேரர் - வானிற்கு வையகம், அள்ளற் பழனத்து, ஏற்றார் தியானும் என்று தொடங்கும் மூன்று பாடல்கள்.

3. **கண்ணதாசன் - இயேசு காவியம் (பாடுகளின் பாதை)** - 1. கசப்புறு பாத்திரம் - வான் இலங்கு, மூன்று சீடர், நன்மை தீமை, உங்கள் கண்ணில், இன்ன கூறி சோர்விலாது, நேரம் இன்று... எனும் பாடல்கள் மற்றும் வஞ்சக நண்பன் கடவுள்... வேவு பார்க்கும், தூய மைந்தன், நாதன் முன்னம் - எனத் தொடங்கும் பாடல்கள்.

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அலகு III. இலக்கிய வரலாறு

1. கி.பி.13 நூற்றாண்டில் தோன்றிய தமிழ் இலக்கியங்கள்.

   நளவெண்பா – திருவிளையாடற் புராணம் - குலோத்துங்க சோழன் கோவை – தஞ்சைவாணன் கோவை. உரையாசிரியர்கள் - பரிமேலழகர் - பேராசிரியர் - சேனாவரையர் - வைணவ உரைகள்.

2. கி.பி.14 நூற்றாண்டில் தோன்றிய தமிழ் இலக்கியங்கள்.

   வில்லிபாரதம் - கந்தபுராணம் - இரட்டைப் புலவர்கள். உரையாசிரியர்கள் - நச்சினார்க்கினியர் - மயிலைநாதர் - இளம்பூரணர்.

3. கி.பி.15 நூற்றாண்டில் தோன்றிய தமிழ் இலக்கியங்கள்.

   அருணகிரிநாதர் - காளமேகப் புலவர் - கடவுள் மாமுனிகள் - தத்துவராயர் - ஸ்ரீபுராணம் - உதயணகுமாரகாவியம் - திருக்கலம்பகம் - ஆதிநாதர் பிள்ளைத்தமிழ்.

4. சிற்றிலக்கியங்கள்.

   உலா – கலம்பகம் - பரணி – பிள்ளைத்தமிழ் - தூது – பள்ளு – குறவஞ்சி.

5. கிறித்துவர்களின் தமிழ்த்தொண்டு.

6. இஸ்லாமியர்களின் தமிழ்த்தொண்டு.

அலகு IV. இலக்கணம்

1. சொல்லின் பொது இலக்கணம்

2. பெயர்ச்சொல் - ஆறுவகைப் பெயர்கள், ஆகுபெயர்

3. வினைச் சொல்லின் பொது இலக்கணம், தெரிநிலைவினை, குறிப்புவினை, கால இடைநிலைகள், ஏவல், வினைமுற்று, வியங்கோள் வினைமுற்று, செய்வினை, செயப்பாட்டுவினை, தன்வினை, பிறவினை.

4. இடைச்சொல்லின் பொது இலக்கணம் ஏகார இடைச்சொல், ஓகார இடைச்சொல், உம் இடைச்சொல்.

5. உரிச்சொல்லின் பொது இலக்கணம்.

அலகு V. உரைநடை

1. உலகப் பண்பாட்டில் இந்தியப் பண்பாட்டின் பங்கு

   - முனைவர் ஜி. ஜான் சாமுவேல்.

2. நண்பன் - புகழ் - தாய்மண்

   - கவிஞர் வைரமுத்து.

3. எண்ணங்களே வருக. கட்டுரை மட்டும்.

   - முனைவர் எம். எஸ்.உதயமூர்த்தி.

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தமிழ் - அடித்தளப்படிப்பு - தாள் - 2

வினாத்தாள் அமைப்புமுறை - வினாக்கள் பகிர்வு

பருவமுறை (SEMESTER PATTERN)

இரண்டாம் பருவம் 17U2FT2)

பாடம்	பகுதி அ	பகுதி ஆ	பகுதி இ
செய்யுள் I	2	2	1
செய்யுள் II	2	2	1
இலக்கிய வரலாறு	2	2	1
இலக்கணம்	2	2	1
உரைநடை	2	2	1
மொத்தம்	10	10	5

MUTHURANGAM GOVERNMENT ARTS COLLEGE

(AUTONOMOUS)

VELLORE – 632 002.

FOUNDATION TAMIL

Syllabus

DEGREE COURSE

CBCS PATTERN

Second Year

பருவமுறை

CBCS

(SEMESTER - PATTERN)

(2017-2018 ஆம் கல்வியாண்டு முதல்)

முத்துரங்கம் அரசினர் கலைக் கல்லூரி

(தன்னாட்சி)

வேலூர் - 632 002

பாடத்திட்டம்

அடித்தளப் படிப்பு

பகுதி - 1 தமிழ்

இளங்கலை, இளம் அறிவியல்,

(பி.ஏ., பி.எஸ்சி., பட்டப்படிப்புகளுக்கு)

இரண்டாம் ஆண்டு

பருவமுறை

CBCS

(SEMESTER - PATTERN)

(2017-2018 ஆம் கல்வியாண்டு முதல்)

<div align="center">

மூன்றாம் பருவம் - தாள் - 3   16U3FT3
(THIRD SEMESTER)

</div>

அலகு I. செய்யுள்.

1. **திருக்குறள்** - அறத்துப்பால் - பாயிரவியல் (முதல் நான்கு அதிகாரங்கள்)

    1. கடவுள் வாழ்த்து

    2. வான் சிறப்பு

    3. நீத்தார் பெருமை

    4. அறன் வலியுறுத்தல்

2. **சிலப்பதிகாரம்** - வழக்குரை காதை மட்டும்

3. **மணிமேகலை** - ஆதிரை பிச்சையிட்ட காதை மட்டும்

அலகு II. செய்யுள்

1. **சீவக சிந்தாமணி** - விமலையார் இலம்பகம் (தேர்ந்தெடுக்கப்பட்ட 42 பாடல்கள் மட்டும்)

1. முருகுகொப் புளிக்கும்...	2. விழுமணி மாசு...
3. தொழுததம்...	4. வண்ணப்பூ மாலை...
5. அஞ்சன் கோலின...	6. பெருந்தால் பல்லி...
7. பூந்துகில் மாலை...	8. சிறுகண்யானையின் இனம்
9. புகழ்வரைச் சென்னிமேல்...	10. அண்ணல்அம் குன்றின்...
11. மானிடம் பழுத்தன	12. சாரல் அம் திமிசிடைச்...
13. மைந்தரை...	14. வருகையின்...
15. வீழ்பனிப்...	16. கூகையும்
17. பொறிமயில்	18. எல் இருள்
19. எங்கணான்	20. வாள்திறல்...
21. கெடலரும்	22. யானலன்...
23. எனக்கு உயிர்ச்...	24. சிறகால்...
25. மரவம்	26. நலிவு இல்...
27. நீதி யாலறுத்து	28. ஒற்றர்...
29. வென்றி	30. பொன்னின்

31.	நிலத்தின்...	32.	எரியொடு...
33.	கெலுழனோ...	34.	இடத்தொடு...
35.	இழைபொறை...	36.	ஊழிவாய்த்
37.	பொருவருங்...	38.	கார் தோன்ற
39.	நன்றப் பொருளே...	40.	வேல்தைவந் தன்ன...
41.	மன்றற்கு...	42.	காவியின் மேல்

எனத் தொடங்கும் பாடல்கள்.

2. **கம்பராமாயணம் - கும்பகர்ணன் வதைப்படலம் - யுத்தகாண்டம்**
    (தேர்ந்தெடுக்கப்பட்ட 61 பாடல்கள் மட்டும்)

1.	நன்று இது...	2.	கிங்கரர்...
3.	உறங்குகின்ற	4.	என்று சொல்ல
5.	என்றலுமே	6.	மூவகை...

இராவணன் முன் சென்று கும்பகர்ணன் வணங்குதல்

7.	கூயினன்...	8.	நிலை கிடந்த

தம்பியைத் தழுவி, உணவு அளித்துப் போர்க்கோலம் செய்தல்

9.	வண் துணைப்...	10.	உடன் இருத்தி...

போர்க்கோலம் செய்தது ஏன்? என்று கும்பகர்ணன் வினவுதல்

11.	அன்ன காலையின்

கும்பகர்ணனைப் போர் செய்ய இராவணன் ஏவுதல்

12.	வானரப் பெருந்...

கும்பகர்ணன் அறிவுரை...

13.	ஆனதோ வெஞ்சமம்?	14.	கிட்டியதோ...
15.	கொடுத்தனை...	16.	தஞ்சமும்...
17.	காலினின்...	18.	என்று கொண்டு...
19.	தையலை விட்டு...	20.	பந்தியில்...

இராவணன் சினமொழி

21.	உறுவது தெரிய...	22.	மறம்கிளர்...
23.	மானிடர்...	24.	தருக, என் தேர்...

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'இது பொருத்தி' என்று கூறி, கும்பகர்ணன் போருக்கு எழுதல்

25. அன்னது கண்டு...   26. வென்று...

27. இற்றைநாள்...

கும்பகர்ணனை, 'இவன் யார்?' என வீடணனிடம் இராமன் வினவல்

28. பாந்தளின்...   29. தோளொடு...

வீடணன் கும்பகர்ணனது தன்மையை எடுத்துரைத்தல்

30. ஆரியன்...   31. ஆழியாய்

32. ஊன்...   33. திறம்...

34. தருமம்...   35. மறுத்த...

36. நன்று...

சுக்கிரீவன், கும்பகர்ணனை உடன் சேர்த்துக்கொள்ளுதல் நலம் எனல்

37. என்று அவன்...

கும்பகர்ணனை அழைத்துவர வீடணன் செல்லுதல்

38. ஏகுதற்கு...   39. தந்திரக் கடலை...

கும்பகர்ணன் வந்தது தகுதி, அன்று என வீடணுக்குக் கூறுதல்

40. நீதியும்...   41. ஏற்றிய...

42. ஐயநீ...   43. வருவதும்...

இராமனைச் சரண்புகுமாறு வீடணனைக் கும்பகர்ணனுக்கு உரைத்தல்

44. இருள் உறு...   45. எனக்கு...

46. தீயவை...   47. தீவினை...

48. உடலிடைத்...   49. முனிவரும்...

50. வேத நாயகனே...

கும்பகர்ணன் மறுப்புரை

51. தும்பி அம்...   52. நீர்கோல...

53. மலரின்...   54. கருத்து...

55. தும்பிஅம்...   56. செம்பு இட்டுச்

57. அனுமனை...   58. செருவிடை...

59. ஆகுவது...

வீடணன் விடை பெறுதல்

60. என்று அவன் தன்னை... 61. வணங்கினான்...

எனத் தொடங்கும் பாடல்கள்.

3. **பெரியபுராணம் - இளையான் குடிமாறன் நாயனார் புராணம்**

1. அம்பொன்... 2. ஏரின்...

3. ஆரம்... 4. கொண்டு...

5. ஆளும்... 6. செல்வம்...

7. இன்னவாறு... 8. மற்று...

9. மாரிக்... 10. ஈர...

11. நமக்கு... 12. மாது...

13. செல்லல்... 14. மற்று அம்...

15. பெருகு... 16. எண்ணும்...

17. உள்ளம்... 18. காலினால்

19. வந்தபின்... 20. முறித்து...

21. வழிவரும்... 22. மனைவியார்...

23. கணவனார்... 24. அழுந்திய...

25. மால்... 26. அன்பனே...

27. இப்பரிசு... எனத் தொடங்கும் பாடல்கள்.

அலகு III.   இலக்கிய வரலாறு

1. பதினென்கீழ்க் கணக்கு நூல்கள்.

2. ஐம்பெருங் காப்பியங்கள்.

3 ஐம்சிறுங் காப்பியங்கள்.

4 பக்தி இலக்கியங்கள்.

1. சைவம். 2. வைணவம்.

5. பெரியபுராணம், கம்பராமாயணம்.

அலகு IV. இலக்கணம்

யாப்பு:

1. எழுத்து
2. அசை
3. சீர்
4. தளை
5. அடி
6. தொடை

பாவகைகள்:

1. வெண்பா வகைகள்
2. ஆசிரியப்பா வகைகள்

அலகு V. பயன்பாட்டுத் தமிழ், சிறுகதைகள்.

1. **பயன்பாட்டுத் தமிழ்.**

   1. அகர வரிசைப்படுத்துதல்.

   2. ஒரு பொருள் குறித்த பல சொல்

   3. பல பொருள் குறித்த ஒரு சொல்

   4. தொடர் பிழை நீக்கி எழுதுதல்

      1. திணை மயக்கம்

      2. பால் மயக்கம்

      3. எண் மயக்கம்

      4. இட மயக்கம்

      5. கால மயக்கம்

   5. பிற மொழிச் சொற்களை நீக்கி எழுதுதல்.

2. **சிறுகதைகள்**

   1. மூத்த பொய்மைகள் - க. கிருஷ்ணமூர்த்தி.

   2. சிலையல்ல கண்ணகி — சோ. தர்மன்.

   3. ஐஞ்சிக் கண்ணன் - இணையம்.

   4. பரிசு - முனைவர் அ. விநாயமூர்த்தி.

   5. மரங்களின் கதை — பாவண்ணன்.

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தமிழ் - அடித்தளப்படிப்பு - தாள் - 3

வினாத்தாள் அமைப்புமுறை - வினாக்கள் பகிர்வு

பருவமுறை (SEMESTER PATTERN)

மூன்றாம் பருவம் 17U3FT3

பாடம்	பகுதி அ	பகுதி ஆ	பகுதி இ
I. செய்யுள்	2	2	1
II. செய்யுள்	2	2	1
III. இலக்கிய வரலாறு	2	2	1
IV. இலக்கணம்	2	2	1
V. 1. பயன்பாட்டுத் தமிழ்	2	2	-
2. சிறுகதைகள்	-	-	1
மொத்தம்	10	10	5

<center>

நான்காம் பருவம் - தாள் - 4 தமிழ்   17U4FT4
(FOURTH SEMESTER)

</center>

அலகு **I.** செய்யுள்

    1.   **புறநானூறு**

        1.   ஆவு மானியற்... 9   2.   உண்டாலம்ம 182

        3.   உற்றுழி யுதவியு... 183   4.   யாது மூரே 192

        5.   கெடுக சிந்தை 279

    2.   **நற்றினை**

        1.   நின்ற சொல்லர்... 1   2.   வானிகுபு சொரிந்த... 142

        3.   தடமருப்பு எருமை... 120   4.   பிரசங்கலந்த... 110

        5.   இறவுப்புறத்தன்ன... 19

    3.   **பரிபாடல்**

        வையை பற்றிய ஒரு பாடல் மட்டும் 'திரையிரும் பனிப்பௌவம்' (ஏழாம் பாடல் - வையை)

அலகு **II.** செய்யுள்

    1.   பட்டினப்பாலை - முழுவதும்

அலகு **III.** இலக்கிய வரலாறு

பாடந்தழுவிய இலக்கிய வரலாறு

    1.   அகத்தியம்

    2.   தொல்காப்பியம்

    3.   முச்சங்க சரலாறு

    4.   சங்க இலக்கியங்கள் - எட்டுத்தொகை - பத்துப்பாட்டு

    5.   சங்க காலம் பொற்காலம்.

அலகு **IV.** இலக்கணம்

அகத்திணை, புறத்திணை, அணி

    1.   **அகத்திணை**

        1.   எழுதிணைகளுக்குரிய விளக்கம்

        2.   ஐந்திணைகளுக்குரிய முதற்பொருள், கருப்பொருள், உரிப்பொருள்

<center>9</center>

2. புறத்திணை

வெட்சி, வஞ்சி, உழிஞை, தும்பை, வாகை, பாடாண், காஞ்சி முதலிய திணைகளுக்குரிய விளக்கம் மட்டும்.

3. அணி

1. உவமையணி

2. எடுத்துக்காட்டு உவமையணி

3. இல்பொருள் உவமையணி

4. உருவக அணி

5. வேற்றுப்பொருள் வைப்பணி

6. தற்குறிப்பேற்ற அணி

7. பிறிது மொழிதல் அணி

8. சொற்பொருள் பின்வரு நிலையணி

9. இரட்டுற மொழிதல் அணி

அலகு V. நாடகம், பொதுக் கட்டுரை.

அ. நாடகம்

1. பதினாறுகால் மண்டபம் - முனைவர் ஆறு.அழகப்பன்.

2. செக்கிழுத்த செம்மல் - அரு. சோமசுந்தரன்.

ஆ. பொதுக் கட்டுரை.

தமிழ் - அடித்தளப்படிப்பு - தாள் - 4

வினாத்தாள் அமைப்புமுறை - வினாக்கள் பகிர்வு

பருவமுறை (SEMESTER PATTERN)

நான்காம் பருவம் 17U4FT4

பாடம்	பகுதி அ	பகுதி ஆ	பகுதி இ
செய்யுள் I	2	2	1
செய்யுள் I I	2	2	1
இலக்கிய வரலாறு	2	2	1
இலக்கணம்	2	2	1
1. நாடகம்	2	2	-
2. பொதுக்கட்டுரை	-	-	1
மொத்தம்	10	10	5

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS)
VELLORE-2
DEPARTMENT OF ENGLISH
I BA SYLLABUS

SEMESTER I

CORE PAPER I   **POETRY**   **CODE 17U1EN1**

UNIT I

DETAILED

John Milton - Paradise Lost   Book – I

UNIT II

DETAILED

Alfred Tennyson - The Lotus Eaters

UNIT III

NON DETAILED

John Donne - Death be not proud

Alexander pope - Ode on Solitude

Oliver Gold Smith - The Village School Master

UNIT - IV

NON - DETAILED

William Wordsworth - The Stolen Boat (Extract from the Prelude Book I)

S.T Coleridge - Kublakhan

John Keats - Ode on a Grecian Urn

Robert Browning - My Last Duchess

UNIT - V

NON DETAILED

D.G. Rossetti - The Blessed Damsel

Matthew Arnold - The Forsaken Merman

Ted Hughes - Thrushes

CORE PAPER II **LITERARY FORMS** **CODE 17U1EN2**

UNIT I

The Essay: The Aphoristic Essay, The Critical Essay, The Personal Essay and Biography

UNIT II

Poetry: The Lyric, The Ode, The Sonnet, The Elegy, The Epic, The Ballad and Dramatic Monologue

UNIT III

Tragedy: Origin, Definition, types, Tragic- comedy and Melodrama

UNIT IV

Comedy: Types of Comedy, Farce and Masque

UNIT V

Novel: The Historical Novel- Detective Novel - Stream of Consciousness Novel

REFERENCE

1. Literary Forms: Ramachandran Nair, Emerald Publishers.

2. William Henry Hudson: "An Introduction to the Study of Literature", Kalyani Publishers, Ludhiana.

3. A Background to the Study of English Literature: Birjadish Prasad, Macmillan Publishers

ALLIED PAPER I
SOCIAL HISTORY OF ENGLAND
AND
HISTORY OF ENGLISH LITERATURE- I

CODE   17U1AEN1

UNIT I

Early History of England: The Hundred Years War (1337-1453)

The Wars of Roses

Tudor England: The Renaissance, The Reformation

UNIT II

The Stuart Age, Puritanism, Colonial Expansion and Restoration England

UNIT III

Prose

Thomas More, Sir Philip Sidney, Francis Bacon and Bible

UNIT IV

Poetry

Geoffrey Chaucer, Edmund Spencer, John Donne, John Milton, John Dryden and Alexander Pope

UNIT V

Drama

Mysteries, Miracles, Moralities, Interludes, Early English Drama, The University Wits and William

Shakespeare and Jacobean Drama

Text

An Outline of History of English Literature - William Hudson

The Social History of England - Padmaja Ashok

Reference

History of English Literature -Edward Albert

A History of English Literature - Arthur Compton - Rickett

Social History of England - G.M. Trevelyan

SEMESTER II

CORE   PAPER III   LITERARY TERMS AND CONCEPTS   CODE   17U2EN3

UNIT   I

Naturalism, Realism, Existentialism, Imagism and Surrealism

UNIT II

Marxism, Feminism, Modernism and Post-modernism

UNIT III

Allegory, Alliteration, Conceit, Imagery, Sprung Rhythm, Irony, Metaphor, Onomatopoeia and Personification

UNIT IV

The Unities, Comic relief, Catastrophe, Denouement, Bathos, Pun and Peripeteia

UNIT -V

Carpe diem, Ubi Sunt, Myth, Pathetic fallacy, Poetic Justice and Poetic License

REFERENCE

A Glossary of Literary Terms by M.H.Abrams

A Dictionary of Literary Terms by Martin Gray

A Handbook on Principles of Literary Criticism by Ravindranathan

CORE PAPER IV   **INDIAN WRITING IN ENGLISH**   **CODE**   **17U2EN4**

UNIT - I

POETRY DETAILED

Tagore - 1-5 lyrics from Gitanjali

Arun Kolatkar - The Bus

UNIT - II

POETRY NON - DETAILED

Nissim Ezekiel - Background Casually

R. Parthasarathy - Under another Sky

UNIT - III

PROSE DETAILED

 Shashi Tharoor - India: "From Midnight to Millennium" Chapter 1

PROSE NON - DETAILED

Nirad C. Chaudhri - To Live or Not to Live

UNIT - IV

DRAMA DETAILED

Mahesh Dattani - Final Solutions

UNIT - V

FICTION

NON - DETAILED

Nayantara Saghal - Rich Like Us

ALLIED PAPER II
CODE 17U2AEN2

UNIT I

The Great Plague of 1665 and The Great Fire of 1666

Queen Anne's Age, The Effects of French Revolution

UNIT II

Industrial Revolution, Agrarian Revolution and Humanitarian Movements

UNIT III

Prose – John Dryden, John Bunyan, Richard Steele, Joseph Addison, Jonathan Swift, Dr. Samuel Johnson and Charles Lamb

UNIT IV

Poetry – Thomas Gray, William Blake, William Wordsworth, S.T. Coleridge, P.B. Shelley and John Keats

UNIT V

Drama – Ben Jonson, John Webster, Beaumont and Fletcher, William Wycherley and William Congreve

Fiction – Daniel Defoe, Samuel Richardson, Henry Fielding, Jane Austen and Sir Walter Scott

Text

An Outline of History of English Literature- William Hudson

The Social History of England – Padmaja Ashok

Reference

A Compendious History of English Literature - R.D. Trivedi.

A History of English Literature-Arthur Compton - Rickett.

Social History of England - G.M. Trevelyan

PAPER V   **DRAMA**   **CODE   17U3EN5**

DETAILED

UNIT I

Christopher Marlowe - Dr. Faustus

UNIT II

Richard Brinsley Sheridan - The School for Scandal

NON DETAILED

UNIT III

Oscar Wilde - Lady Windermere's Fan

UNIT IV

Bernard Shaw - Arms and the Man

UNIT V

Samuel Beckett - Waiting for Godot

PAPER VI **MODERN   ENGLISH GRAMMAR** **CODE   17U3EN6**

UNIT I

Parts of speech, Auxiliaries and Modal Auxiliaries

UNIT II

Concord and Reported Speech

UNIT III

Sentence Pattern, Infinitive and Participle Constructions

 UNIT IV

Adjunct, conjunct and Disjunct

UNIT V

Clauses and Phrases, Simple, Compound and Complex Sentences

References

1. Close, R.A University Grammar of English, Workbook. London. Longman, 1947

2. James Sledd: A Short Introduction to English Grammar. Princetonhall. PUP, 1972

3. Leech, Geoffery and Jan Svartvik. A Communicative Grammar of English. Harlow: English Language Book Society/Longman, 1975.

4. Quirk, et al: A University Grammar of English (student Edition). London. Longman, 1973.

ALLIED PAPER III   SOCIAL HISTORY OF ENGLAND

AND

HISTORY OF ENGLISH LITERATURE – III   CODE 17U3AEN3

UNIT I   SOCIAL HISTORY OF ENGLAND

Victorian Age, Reform Bills, Development of Transport and Communication and Development of Education

UNIT II

Prose

Thomas Carlyle, William Hazlitt, John Ruskin and Mathew Arnold

UNIT III

Poetry

Robert Browning, Alfred Lord Tennyson, Mathew Arnold and G.M. Hopkins

UNIT IV

Drama

Oscar Wilde and Harold Pinter

UNIT V

Fiction

Charles Dickens, Bronte Sisters, George Eliot and Thomas Hardy

Text

An Outline of History of English Literature - William Hudson

The Social History of England - Padmaja Ashok

Reference

An Outline of History of English Literature - William Hudson

A Short History of English Literature - Emile Legouis

Social History of England - G.M. Trevelyan

SKILL BASED I   **SKILLS FOR EMPLOYMENT**   **CODE   17U3ENSB**

UNIT I

Preparing a CV or Resume

UNIT II

Preparing minutes of a meeting

UNIT III

Presenting data in verbal and Non - verbal mode

UNIT IV

Reading and replying to E-mails

UNIT V

The Correct Attitude of Employment

Prescribed Text

"Skills for Employment" by Prof.S.Yusuf ,Maaph Popular Classsics

 Developing Communications Skills: Krishna Mohan and Meera Banerji

ORAL COMMUNICATION- FUNCTIONAL   CODE 17U3ENNM

UNIT I

Greeting and Introducing

Inviting a Person

UNIT II

Seeking Permission

Offering a Suggestion and Giving an Advice.

UNIT III

Persuading

Asking Questions

UNIT IV

Praising and Complimenting

Complaining and Apologizing

UNIT V

Expressing Sympathy

Phoning

References

Farhathullah T.M Communication Skills for Undergraduates, RBA Publications, 2004

Krishnaswamy N et al Mastering Communication Skills and Soft Skills, Bloomsbury, 2015

PAPER VII   **PROSE**   **CODE   17U4EN7**

UNIT I

Francis Bacon - Of Studies, Of Parents & Children

Addison & Steele - The Spectator Club

Goldsmith - A City Night Piece

UNIT II

Charles Lamb - Old China

William Hazlitt - On going a Journey

R.L. Stevenson - On falling in love

UNIT III

The Bible - The Book of Job

G.K Chesterton - On Running after One's Hat

Bertrand Russell - The Functions of a Teacher

UNIT IV

E.M Forster - What I Believe

Virginia Woolf   - How Should One Read A Book

George Orwell – Shooting an Elephant

UNIT V

J.B.S Haldane - On Being the Right Size

Julian Huxley - Life Can Be Worth Living

A.G Gardiner - All about a Dog

DETAILED

UNIT I

As You Like It

UNIT   II

Macbeth

NON - DETAILED

UNIT III

Julius Caesar

UNIT IV

The Tempest

UNIT V

Sonnets 18, 30, 60

ALLIED PAPER IV   SOCIAL HISTORY OF ENGLAND AND

HISTORY OF ENGLISH LITERATURE – IV

UNIT I   SOCIAL HISTORY OF ENGLAND

British Life in Twentieth Century

Life between the Two World Wars

The Effect of the Second World War

Social Security and the Welfare State

Effects of the Cold War

Life in Sixties

Life in Seventies

Life in Eighties

UNIT II

Prose

Aldous Huxley, G.K. Chesterton, George Orwell, A.G. Gardiner and John Lynd

UNIT III

Poetry

W.B. Yeats, T.S. Eliot, W.H. Auden, Stephen Spender, Ted Hughes and Cecil Day Lewis

UNIT IV

Drama

G.B. Shaw, John Galsworthy, J.M. Synge, Samuel Beckett and John Osborne

UNIT V

Fiction

H.G. Wells, D.H. Lawrence, James Joyce, Virginia Woolf, William Golding, Joseph Conrad, Christopher Fry and Kingsley Amis

Text

An Outline of History of English Literature - William Hudson

The Social History of England - Padmaja Ashok

Reference

 A Short History of English Literature - Pramod. K. Nayar

Social History of England - G.M. Trevelyan

UNIT I

Conversational English

Introducing, Requesting, Inviting, Congratulating, Apologising, Thanking

UNIT II

Conversational English

Complaining, Ordering, Booking, Asking For Information, Telephonic Conversation

UNIT III

Formal Letters

Letters of Enquiry, Placing Orders, Complaints and Thanks

UNIT IV

Dialogue Writing

Conversation with Friend, Parent, Teacher, Principal and stranger

UNIT V

Errors based on Concord, Prepositions and Articles.

ORAL COMMUNICATION - SITUATIONAL   CODE   17U4ENNM

UNIT I

Speaking about Oneself

The Media

UNIT II

Imagining

Favourite Dishes

UNIT III

Inviting Personalities

Getting Married

UNIT IV

Breaking the Law

Honouring Persons

UNIT V

Brain Storming

Role - Play

PAPER IX   **FICTION**   **CODE   17U5EN9**

UNIT I

Samuel Richardson -   Pamela

UNIT II

Jane Austen - Pride and Prejudice

UNIT III

Charles Dickens   - Tale of Two Cities

UNIT IV

George Eliot   - The Mill on the Floss

UNIT V

James Joyce   - Ulysses

UNIT I   POETRY DETAILED

Journey of the Magi – T.S. Eliot

Among School Children – W.B. Yeats

UNIT II POETRY NON-DETAILED

The Unknown Citizen – W.H. Auden

Do Not Go Gentle into that Good Night – Dylan Thomas

UNIT III

PROSE DETAILED

On Falling in love - Aldous Huxley

On the Philosophy of Hats - A.G.Gardiner

NON - DETAILED

Lectures – J.B. Priestly

UNIT IV

DRAMA-DETAILED

The Admirable Crichton – J.M. Barrie

NON - DETAILED

St. Joan – G.B. Shaw

UNIT V   FICTION

Time Machine – H.G. Wells

Edward Albee – Who's Afraid of Virginia Woolf?

UNIT I

The Indo-European Family of Languages

General characteristics of English Language

UNIT II

Characteristics of Old English (450 A.D. – 1150 A.D.)

Middle English (1066 A.D. – 1500 A.D.)

Modern English (1500 A.D. –Present)

UNIT III

French Influence

Bible Translation and the Impact of Bible Translation on English Language

Shakespeare's Contribution

John Milton's Contribution

UNIT IV

History of Spelling and Pronunciation

The Development of Dictionaries

UNIT V

Homophones and Homonyms

Archaism

Intonation

English as a World Language

Ref

 The History of English Language by C.L. Wrenn

ELECTIVE I   ENGLISH FOR BETTER COMMUNICATION   CODE   17U5ENE1

UNIT I

Collocation: Types of Collocation.

UNIT II

Common errors in Spoken and Written English, Prepositions

UNIT III

Articles and word-order in the sentence

UNIT IV

Reconstructing jumbled sentences into logical sequence

UNIT V

Describing a given object, picture or scene (Adjectives)

Reference

General English for Competitive Examinations (R.Gopalan,V.Rajagopalan,Roopkumar Balasingh)

ELECTIVE II   **OFFICIAL CORRESPONDENCE**   **CODE 17U5ENE2**

UNIT I

Formal Letters -   Letter of Enquiry, Placing Orders, Complaints, Thank You Letters

UNIT II

Note Making

UNIT III

Formal Reports

UNIT IV

E-Mails, Fax, Notices, Agenda, Minutes

UNIT V

Comprehension, Extracts (Business Précis)

Reference

Developing Communication Skills by Krishna Mohan & Meera Banerjee

SKILL BASED III   WRITING SKILLS - PROFESSIONAL   CODE   17U5ENSB

UNIT I

Resume Writing and cover letter

Comparing and Contrasting

UNIT II

Writing a report

Proposals

UNIT III

Writing a Memorandum

Writing minute of the proceedings of a meeting

UNIT IV

Paragraph Writing

Note taking and Note Making

Describing People

UNIT V

Notices

Reference

Communication Skills for Undergraduates T.M.Farhathullah

SEMESTER VI

PAPER XII   **PRINCIPLES OF LITERARY CRITICISM**   **CODE**   **17U6EN12**

UNIT I

Introduction to Literary Theory-Literary History-Literary Criticism

UNIT II

Classical Criticism- Plato, Aristotle, Horace, Quintilian, Longinus

UNIT III

Critical Theories, Mimetic Theories, Pragmatic Theories – Sidney, Dryden, Dr. Johnson, Coleridge, Arnold, T.S. Eliot

UNIT IV

Critical Approach-Moralistic Approach, Psychological, Art and Neurosis-Archetypal, Sociological, Formalistic Approach

UNIT V

Recent Theories - Structuralism, Post - structuralism, Postmodernism, Postcolonialism, Feminism

Reference

An Introduction to Literary criticism by B.Prasad, Macmillan, Madras

A Hand Book on Principles of Literary Criticism by S. Ravindranathan

PAPER XIII **AMERICAN LITERATURE** **CODE 17U6EN13**

UNIT I

POETRY DETAILED

Robert Frost - Mending Wall

Emily Dickinson - The soul selects her own society

Emerson – Hamatreya

UNIT II

POETRY NON-DETAILED

Sylvia Plath - Mirror

Theodore Roethke - The Meadow Mouse

Walt Whitman - I Hear America Singing

UNIT III

PROSE DETAILED

Robert Frost - The Figure A Poem Makes

H.D Thoreau - Winter Animals (Walden-Chapter 15)

PROSE NON-DETAILED

R.W Emerson - The American Scholar

UNIT IV

DRAMA-DETAILED

Eugene O Neill - The Emperor Jones

Drama-Non Detailed

Arthur Miller - All My Sons

UNIT V

 FICTION

E. Hemingway - A Farewell to Arms

Mark Twain - The Adventures of Huckleberry Finn

PRESCRIBED TEXT

Poetry - American Literature (An anthology of poems)

 Ed C.Subbiah Emerald Publishers 2010

Prose - American Literature An anthology Ed Dr.P.Marudanayagam,Emerald Publishers 2010

PAPER XIV   **ENGLISH PHONETICS**   **CODE 17U6EN14**

UNIT I

What is Phonetics?

The Airstream Mechanism

The Respiratory System

The Articulatory System

The Phonatory System

UNIT II

Classification of Consonant Sounds

Description of Consonant Sounds

UNIT III

Cardinal Vowels.

Classification of Vowels

Description of Vowels

UNIT IV

Word - Accent in English.

Intonation

Phonetic Transcription: One syllable and two syllable words

UNIT V

Composition of the Syllable

Consonant Clusters in English

Reference

A course in English Phonetics by T.R.Kansakar

A Textbook of English Phonetics for Indian Students - T.Balasubramanian

The Pronunciation of English - Daniel Jones

UNIT I

A Brief History of English Language Teaching

UNIT II

Language acquisition theories

UNIT III

 Teaching of LSRW

UNIT IV

 Teaching of Grammar

UNIT V

 Teaching of Language Games

References

 A Text Book of English Language Teaching by M.N.K. Bose

Methodology in Language Teaching- Jack. C. Richards and Willy A. Renandya

 English Language Teaching (Approaches,Methods,Techniques) - Geetha Nagaraj

ELECTIVE III   **THE SHORT STORY**   **CODE   17U6ENE3**

UNIT I

Life of Ma Parker Katherine Mansfield

UNIT II

Muniyakka – Lakshmi Kannan

A Worn Path-Eudora Welty

UNIT III

The Cloak - Nikolai Gogol

The Blue Carbuncle- Sir Arthur Conan Doyle

UNIT IV

Leo Tolstoy - The Candle

Edgar Allan Poe -The Purloined Letter

UNIT V

Achebe - The Sacrificial Eggs (Memorable Tales)

Guy De Maupassant – The Diamond Necklace

SKILL BASED IV   **PROFESSIONAL COMMUNICATION**   **CODE   17U6ENSB**

UNIT I

Introduction

Communication Modes and Means

UNIT II

Communication Settings and Styles

Inter Personal and Intra Personal Communication

UNIT III

Negotiation

Body Language

UNIT IV

Facing an Interview

Group Discussion

UNIT V

Seminar

Public Speaking

****

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS)
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DEPARTMENT OF ENGLISH

I MA SYLLABUS   **SEMESTER I**

PAPER I   **CHAUCER AND THE ELIZABETHAN AGE**   **CODE 17P1EN1**

UNIT I   **POETRY DETAILED**

1. Chaucer   (1343-1400)   Prologue to the Canterbury Tales

2. John Donne (1573-1599)   Hymn to God the Father

UNIT II   **POETRY NON DETAILED**

1. Edmund Spenser (1552-1599)   Prothalamion
2. Thomas Wyatt   (1503-1542) SONNET 37   I find no peace as all my war is done
3. Earl of Surrey   (1517-1547) SONNET   Spring -The Soote Season,
                                                                    That bud and bloom
4. Philip Sydney   (1554-1586) SONNET 1   From Astrophel and Stella-
                                                                     Loving in truth
                                          LYRIC   Philomela

UNIT III   **PROSE DETAILED**

Francis Bacon   (1531-1626)   Of Ambition, Of Love,
                                                            Of Marriage and Single, Of Studies

PROSE NON-DETAILED

The Gospel According to St.Luke

UNIT IV

DRAMA DETAILED

 John Webster   Duchess of Malfi

UNIT V

DRAMA NON-DETAILED

1. Christopher Marlowe   Edward II
2. Ben Jonson   Volpone

PAPER II   RESTORATION AND EIGHTEENTH CENTURY   CODE 17P1EN2

UNIT I   POETRY DETAILED

1. John Milton   (1608-1674):   Paradise Lost Book IX
2. William Blake   (1757-1827):   From Songs of Innocence: The Echoing Green
                                                         From Songs of Experience: Infant Sorrow

UNIT II   POETRY NON-DETAILED

1. Alexander Pope (1688-1744):   The Rape of the Lock
2. John Dryden   (1631-1695):   Macflecknoe
3. Henry Vaughan (1621-1695):   The Retreat
4. William Collins (1721-1759):   Ode to Evening
5. Robert Burns   (1759 -1796): My love's a Red Red Rose

UNIT III   PROSE

DETAILED
Jonathan Swift   : The Battle of the Books

NON DETAILED
Alexander Pope   : Essay on Critics
Joseph Addison & Richard Steele: The Coverley Papers-.
                                            1. Sir Roger at the Theatre
                                            2. Sir Roger's Opinion of true wisdom
                                            3. Death of Sir Roger

UNIT IV   DRAMA DETAILED

Oliver Goldsmith   :   She Stoops to Conquer

DRAMA   NON- DETAILED
1. Sheridan   : Rivals
2. William Congreve   : The Way of the World

UNIT V   FICTION

1. Daniel Defoe   : Moll Flanders
2. Jonathan Swift   : Gulliver's Travels

UNIT I   POETRY DETAILED

William Wordsworth : Immortality Ode
S.T. Coleridge   : Frost at Midnight
P.B. Shelley   : Ode to the Westwind
John Keats   : Ode to a Nightingale

UNIT II   POETRY NON-DETAILED

William Wordsworth : Nutting
John Keats   : Ode to autumn
Thomas Gray   : Elegy Written in a Country Churchyard
William Morris   : Haystack in the Floods

UNIT III   PROSE DETAILED

William Hazlitt   : a. Of Persons One would wish to have seen
                              b. My First Acquaintance with poets
Charles Lamb   : From Essays of Elias
Dream Children   : A Riverie
Old China

UNIT III   PROSE NON-DETAILED

De Quincey   : Confessions of an Opium Eater

UNIT IV DRAMA

P.B. Shelley   : Prometheus Unbound

UNIT V NOVEL

Walter Scott   : The Heart of Midlothian
Emily Bronte   : Wuthering Heights

PAPER IV **INDIAN LITERATURE IN ENGLISH** **CODE 17P1EN4**

UNIT I POETRY DETAILED

  Toru Dutt   - The Lotus
  Nissim Ezekiel   - Enterprise
  Kamala Das   - The Sun Shine Cat
  Dom Moraes   - A Letter

UNIT II POETRY NON-DETAILED

  Syed Amanuddin   -Don't Call me Indo- Anglian
  Sarojini Naidu   - Indian Weavers
  A.K. Ramanujam   -Obituary
  Arun Kolatkar   - An Old Woman

UNIT III PROSE DETAILED

  Dr. S. Radhakrishnan -   A Hindu View of Life (First Two Chapters)
  DR.BR Ambedkar   - From Annihilation of Castes-4, 5, 6

PROSE NON- DETAILED

  1. Sri Aurobindo -The Renaissance in India

UNIT IV

DRAMA DETAILED
1. Badal Sircar   -Pagla Ghoda(Mad Horse)
2 .Vijay Tendulkar   -Silence! The Court is in Session.

DRAMA NON –DETAILED

1. Tagore   - Natir Puja
2. Girish Karnad   -The Fire and the Rain

UNIT V FICTION
1. Manohar Malgonkar   – Combat of Shadows
2 .Kamala Markandaya   – Possession
3. Anita Desai   – Journey to Ithaca
4. Upamanyu Chatterjee   - English August

ELECTIVE I   SOFT SKILLS, LITERATURE AND MOVIES   CODE   17P1EEN

UNIT I   INTRAPERSONAL

Self – management, self – esteem, self-awareness, self- regulation, self – critique, Jane Eyre

UNIT II   EMPATHY

Honesty, cultural diversity, ability to take other's point of view, integrating cognitive and   affective skills, Nelli in "Wuthering Heights"

UNIT III   INTERPERSONAL

Team work, persuasion, negotiation, conflict resolution, Reading social situations, learning to say no, active listening, Rosalind, Portia and Viola

UNIT IV   COMMUNICATION

Body language, facial expression, humour, eye contact, tone of voice, etiquette
1. Antony and Cleopatra (Movie)
 2. To Sir with Love (Movie)

UNIT V   LEADERSHIP

  Critical, lateral, strategic thinking, delegation, taking responsibility, giving praise and appreciation, giving and receiving feedback ability to motivate, problem solving in "Things Fall Apart" – Achebe.

SEMESTER – II

PAPER V   **SHAKESPEARE**   **CODE 17P2EN5**

UNIT I   DETAILED

Othello

King Lear

UNIT II

Julius Ceaser

Antony and Cleopatra

UNIT III

Much Ado about Nothing

Merchant of Venice

UNIT IV

Henry IV Part I

Winter's Tale

UNIT V

Sonnet 1, 18, 29, 30, 33,104,106,116,134 and 138

PAPER VI **THE VICTORIAN AGE** **CODE 17P2EN6**

UNIT I **POETRY DETAILED**

Matthew Arnold : Dover Beach
G.M. Hopkins : God's Grandeur
Robert Browning : My Last Duchess
Alfred Tennyson : Ulysses
D.G. Rossetti : The Blessed Damozel

UNIT II **POETRY NON-DETAILED**

Christian Rossetti : A Wintry Sonnet
Elizabeth Barrett Browning: The Cry of the Children
William Morris : Iceland First Seen

UNIT III **PROSE DETAILED**

Matthew Arnold : Culture and Anarchy: Sweetness and Light
John Ruskin : Unto This Last

PROSE NON-DETAILED

Thomas Carlyle : The Hero as Man of Letters
Aldous Huxley : Snobberies

UNIT IV **DRAMA**

Oscar Wilde : An Ideal Husband

UNIT V **NOVEL**

Charles Dickens : David Copperfield
Arthur Conan Doyle: The Hound of Baskervilles

PAPER VII   **AMERICAN LITERATURE**   **CODE   17 P2EN7**

UNIT I   POETRY DETAILED

1. Walt Whitman: Passage to India
2. Emily Dickinson: Because I Could Not Stop For Death
3. Robert Frost: Birches
4. Edgar Alan Poe: The Raven
5. R.W.Emerson: Brahma

UNIT II   POETRY NONDETAILED

1. Wallace Stevens: Anecdote of the Jar
2. Carl Sandburg: Chicago
3. E.E.Cummings: The Cambridge Ladies
4. J.C. Ransom: Bells for John Whiteside's daughter
5. Sylvia Plath: Daddy

UNIT III   PROSE

Prose Detailed
1. Edgar Alan Poe: The Philosophy of Composition
2. R.W.Emerson: The American Scholar
Prose Non-Detailed
1. H.D.Thoreau: What I Lived For
2. Irving Babbit: The Critic and the American Life

UNIT IV   DRAMA

Drama Detailed

1. O'Neill: Long Day's Journey into Night
2. Edward Albee: Who is afraid of Virginia Woolf?
Drama Non-Detailed
1. Marsha Norman: Night Mother
2. Tennesse Williams: The Glass MenagerieS

UNIT V   FICTION

1. Henry James: Portrait of the Lady
2. Alice Walker: The Color Purple

PAPER VIII   ENGLISH LANGUAGE TEACHING   CODE 17P2EN8

UNIT I

A Brief History of Language Teaching

UNIT II

Methods in English Language Teaching

Grammar Translation Method

Audio Lingual Method

Direct Method

Total Physical Response Method

Suggestopedia

UNIT III

Current Communicative Approaches

Communicative Language Teaching

Natural Approach

Task-based Language Teaching

Co-Operative Language Learning

Content –Based Instruction

UNIT IV

Teaching Listening, Speaking Reading and Writing

UNIT V

Teaching of Vocabulary

ELECTIVE II   **FILM STUDIES**   **CODE 17P2E EN**

UNIT I

Introduction& Film Theories

A Brief History of Cinema, Important Film Movements, Trends & Film Theories-Auteur Theory, Gender film Theory, Formalist film Theory, Marxist film theory, Psychoanalytical, Film Theory, Genre studies.

UNIT II

Literature and Film

Language of film and fiction, Narratology in literature and cinema, Film and Theatre; Intertextuality ,Film and its interaction with other art forms.

UNIT III

Film as Text
Language of Films, Discourse Analysis of Films; Examining the ideology .

UNIT IV

Alternative Cinema
Queer cinema, Subaltern cinema, Documentary cinema, Third Cinema.

UNIT V

Indian Cinema
History of Indian Cinema, Post-LPG Indian , Cinema, Suppressed ,Discourses in Indian films, Subaltern
            New Cinema, Issues of communalism and secularism in films, Indian movie Stereotypes .

References

What is Cinema? –Andre Bazin, Concepts in Film Theory- Andrew, Dudley . Dr.Zhivago- Poris Pasternak
Lolita- Stanley Koplins, Sergei Eisenstein-Battleship   Potemkin, Jai Bheemarao - Anand Patwardhan
Walter Salva-The Motorcycle Diaries.

SEMESTER III

PAPER IX   TWENTIETH CENTURY LITERATURE   CODE 17P3EN9

UNIT I

POETRY DETAILED

W.B. Yeats   - Easter 1916
T.S. Eliot   - The Wasteland

UNIT II
POETRY NON DETAILED

Hopkins   -   Wreck of Deutschland
Philip Larkin   - Next please
Ted Hughes   - The Thought Fox
Rupert Brooks   - Soldier
Carol Ann Duffy   - Mrs Lazarus
Wilfred Owen   - Anthem for Doomed Youth

UNIT III
PROSE DETAILED

George Orwell   - Politics and the English Language

PROSE NON DETAILED

D.H.Lawrence   - Why the Novel Matters

UNIT IV
DRAMA DETAILED

Samuel Beckett   - End Game

DRAMA NON DETAILED

John Osborne   - Look Back in Anger

UNIT V
FICTION

Virginia Woolf   - To the Lighthouse
 Kingsley Amis   - Lucky Jim

PAPER X   COMMON WEALTH LITERATURE   CODE   17 P3EN10

UNIT I
POETRY DETAILED

Africa   : Roy Campbell – Poets in Africa
Australia   : Judith Wright – Fire at Murdering Hut
New Zealand   : Allen Curnow – House and Land
Canada   : Randolph Stow – Mad Maid's Whim

UNIT II
NON DETAILED

India   : Meena Kandasamy – Touch
Pakistan   : Zulvika Ghose – This Landscape, these People
Ireland   : Cecil Day Lewis – The Neurotic
Scotland   : R.L.Stevenson – Winter
Welsh   : W.H.Davies – Wild oats

UNIT III PROSE DETAILED

Ananda Coomara Samy – The Dance of Shiva

PROSE NON DETAILED

Chinua Achebe: The Novelist as Teacher

UNIT IV
DRAMA DETAILED

Wole Soyinka   – Kongi's Harvest

DRAMA NON DETAILED

Ngugi Wa Thiong'o   – The Black Hermit

UNIT V
FICTION

 Margaret Atwood   – The Edible Woman

J.M.Coetzee   - Disgrace

Adele Wiseman   - Crackpot

PAPER XI   **CLASSICAL CRITICISM**   **CODE   17P3EN11**

UNIT I

Introduction to Classical Literary Criticism

Types of Literary Criticism

Ancient Tamil and Sanskrit Criticism

UNIT II

Aristotle   - Poetics

Longinus   - On the Sublime

UNIT III

Philip Sidney - Apology for Poetry

Dryden   - Essay of Dramatic Poesy

Dr.Johnson   - Preface to Shakespeare

UNIT IV

Mathew Arnold - Study of Poetry

T.S.Eliot   - Tradition and the Individual Talent

UNIT V

Northrop Frye   - The Archetypes of Literature

George Lukacs   - Idealogy of Modernism

PAPER XII   **LANGUAGE AND LINGUISTICS**   **CODE 17P3EN12**

UNIT I

 Definition of Language
 Characteristic of Language
 Descent of English Language
 Old English and Middle English period
 The Renaissance and After
 Evolution of Standard English
 Human and Animal Communication

UNIT II

 Definition of Linguistic
 Is Linguistic a Science?
 The Scope of Linguistics
 Linguistic Levels
 Types of Linguistics

UNIT III

 Linguistic Concept: Synchrony & Diachrony,Langue &Parole,Competence& Performance,
 Substance & Form, Syntagmatic &Paradigmatic

UNIT IV

 Sociolinguistics and ethno linguistics
 Language Variation
 Dialect and Sociolect
 Isogloss
 Registers

UNIT V

 Register &Style, Idiolect, Diglossia, Pidgin, Creole

Reference
 F.T. Wood -   An Outline History of English Language (Chapter 1 -9)
 George Yule -   The Study of Language (Chapter 20 & 21)
 John Lyons –   Language & Linguistics an Introduction

ELECTIVE III   TRANSLATION - THEORY AND PRACTICE   CODE   17P3E- EN

UNIT I

History of Translation and Translation Theory, Aspects of Translation Theory

UNIT II

Types of Translation, Communicative and Semantic Translation

UNIT III

Translation Procedures, Translation Process and Synonymy, Translation and the Meta Lingual Function of Translation

UNIT IV

Linguistics and Translation, Theories of Translation, Equivalence in Translation, Problems in Translation – Untranslatability

UNIT V

Translation Practice in Tamil and English – Proverbs and Prose Passages

Reference

Bassnett, Susan. Translation Studies. London: Methuen, 2002.Malmkjær, Kirsten, and KevinWindle.
 The Oxford Handbook of Translation Studies. Munday, Jeremy
Translation: An Advanced Resource Book. Taylor & Francis, 2004
Newmark, Peter. Approaches to Translation. Oxford: Pergamon Press, 1981
Venuti, Lawrence. The Translation Studies Reader. New York: Routledge, 2004

SEMESTER IV

PAPER XIII   **MODERN CRITICISM**   **CODE 17P4EN13**

UNIT I

  1. I.A. Richard's –   The Four Kinds of Meaning
  2. Ferdinand de Saussure – Course in General Linguistics –Nature of the Sign

UNIT II

  1. Jacques Derrida –   Structure, Sign and Play in the Discourse of Human Sciences
  2. Jonathan Culler -   The Linguistic Foundation

UNIT III

  1. Sigmund Freud –   Creative Writers and Day Dreaming
  2. Kristeva –   Revolution in Poetic Languages

UNIT IV

  1. Stanley Fish –   Is There a Text in the Class?
  2. Wolfgang Iser –   The Interaction between Text and Reader

UNIT V

  1. Simon de Beauvoir –   Selections from "The Second Sex" (pp.993 – 1000)
  2. Gayathri Spivak –   Can the Subaltern Speak?

PAPER XIV   **WOMEN'S WRITING IN ENGLISH**   **CODE 17P4EN14**

UNIT I   POETRY

1. Maya Angelou   : Phenomenal Woman
2. Annie Louisa Walker   : Women's Rights
3. Emily Dickinson   : It was given to me by the Gods
4. Imtiaz Dharker   : Another Woman

UNIT II   PROSE

1. PadminiSen Gupta   : The Position of Women in Ancient India
2. Vandana Shiva   : Eco-Feminism: Masculinization of the Motherland

UNIT III   SHORT STORY

1. Joyce Carol Oates   : The White Cat
2. Katherine Mansfield   : The Doll House
3. C.S. Lakshmi   : A Deer in the Forest

UNIT IV   DRAMA

1. Caryl Churchill   : Top Girls
2. Marsha Morman   : Might' Mother

UNIT V   NOVEL

1. Arundhati Roy   : The God of Small Things
2. Rachel Carson   : Silent Spring

PAPER XV   **PHONETICS AND GRAMMAR**   **CODE 17P4EN15**

UNIT I

What is Morphology?
Morpheme
Classification of Morphemes

UNIT II

1. What is Grammar?
2. Traditional Grammar
3. Structural Grammar
4. Formal vs. Notional Grammar

UNIT III

Sounds and Letters
Cardinal Vowels
English Vowels
Diphthongs and Consonants

UNIT IV
Received Pronunciation, Accent, Rhythm and Intonation,Assimilation,
Elison,Liason and Juncture

UNIT V
Pnonetic Transcription (Dialogue)

REFERENCE
T.Balasubramaniam: A Textbook of English Phonetics for Indian Students

CORE PAPER XVI   COMPARATIVE LITERATURE   CODE 17P4EN16

UNIT I

Definition and Theory of Comparative Literature – Scope, Methodology, Application –

National Literature – Comparative Literature – French and American School

UNIT II

Influence and Imitation – Epoch, Period, Generation – Thematology, Comparing Works

on the Basis of Themes – Genres, Comparing Works on the Basis of Form

UNIT III

Milton's Eve, Kamban's Sita

UNIT IV

G.U. Pope: Two Chapters from the translation of Tirukkural

"Compassion" "Veracity"

Goethe: The Nearness of the Beloved

UNIT V

Anton Chekov: The Cherry Orchid
Kalidasa :Sahuntala

Reference
Susan Bassnett, An introduction to Comparative Literature
Gayatri Spivak, Death of Discipline
Bhatnagar, M K. Comparative English Literature. New Delhi: Atlantic Publishers and Distributors, 1999
George, K M. Comparative Indian Literature Trichur: Kerala Sahitya Akademi, 1984
Pawar S. Comparative Literary Studies: An Introduction.
Duckworth N.p., 1973.
Weisstein, Ulrich. Comparative Literature and Literary Theory: Survey and Introduction.

ELECTIVE IV   RESEARCH METHODOLOGY   CODE 17P4E-EN

UNIT I
Research and Writing

UNIT II
 Plagiarism and Academic Integrity

UNIT III
The Mechanics of Writing

UNIT IV
 The Format of the Research Paper

UNIT V
 Documentation: Preparing the List of Works Documentation Citing Sources in the Text

Reference
MLA Handbook for Writers of Research Papers – Joseph Gibaldi– Eighth Edition

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS) VELLORE -2

DEPARTMENT OF ENGLISH

M.PHIL SYLLABUS (FULL TIME/PART TIME) 2017-2019

PAPER-1   RHETORIC AND RESEARCH METHODOLOGY   CODE 17MEN1

UNIT I

What is research? Types of Research - Research area - Survey of Literature - Working Bibliography - Research Gap - Identification of research problem - Working Outline - Drafting - Final Draft - Computer in research in English.

UNIT II

Mechanics of Research and Documentation - Online Sources - Suitable language and style - Abbreviations - Quotations - Ellipses - Parenthesis - Different kinds of Philosophy - Works Cited.

UNIT III

Modes of Writing - Expository - Argumentative- Persuasive - Meditative – Polemical - Dramatic

UNIT IV

Literary Devices - Alliteration - Allusion - Analogy - Bathos - Caricature - Conceit - Hendiadys - Hyperbole - Imagery - Metaphor - Oxymoron - Paradox - Pathos - Simile.

UNIT V Practical Criticism

1. Prose

2. Poetry

3. Drama

4. Fiction

Reference

1.Brooks and Warren, rhetoric

2. R. K. Singh, Mechanics of research writing

3. Joseph Gibaldi, MLA hand book for writers of research papers

4. Anderson, Thesis and Assignment writing

5. Chris Mounsey, Essays and Dissertation

PAPER-II   CONTEMPORARY LITERARY CRITICISM   CODE: 17MEN2

UNIT I

1. Technique as Discovery- Mark Schorer

2. Literary Criticism and Philosophy-F.R. Leavis

3. The Language of Paradox -Cleanth Brook

UNIT II

1. The Sense of the Past- Lionel Trilling

2. Literature as context: Milton's Lycidas- Northrop Frye

3. Objectivity in Fiction- Wayne Booth

UNIT III

1. Structuralism and Literary Criticism- Gerard Genette

2. Structure, Sign and Play in the discourse of Human Sciences- Jacques Derrida

3. From Word to Text- Roland Barthes

UNIT IV

1. Cultural Identity and Diaspora- Stuart Hall

2. Feminism and Critical Theory- Gayathri Spivak

3. Capitalism, Modernism, Post-Colonialism-Terry Eagleton

UNIT V

1. Crisis (In Orientalism)- Edward Said

2. Home and Exile - Chinua Achebe

3. A Phenomenological approach - Wolfgang Isher

Texts Prescribed

1. Five Approaches to Literature - Wilbur Scott

2. 20th Century Literary Criticism - David Lodge

3. Modern Criticism and Theory - David Lodge

4. Literary Criticism - B. Das and J. M. Mohanty

5. Contemporary criticism – Sethuraman

GUIDE PAPER

ELECTIVE I   **POETRY**   **CODE 17ME-EN1**

UNIT I

Spenser   Faerie Queene Book I

Pope   The Rape of the Lock

UNIT II

T.S. Eliot   The Wasteland

G.M. Hopkins   The Wreck of Deutschland

UNIT III

Edwin Arlington Robinson   The Man against the Sky

Robert Frost   The Death of a Hired Man

Walt Whitman   When Lilacs Last on the Dooryard Bloom'd'

UNIT IV

Richard Ntiru   The Shape of Fear

Gabriel Okara   Once Upon a Time

A.D. Hope   The Death of a Bird

Judith Wright   The Harp and the King

Margaret Atwood   Journey to the Interior

Taken from the Anthology of Commonwealth Poetry Ed by C.D. Narasimiah

UNIT V

Rabindranath Tagore   Gitanjali

A.K.Ramanujam   Small Scale Reflections on a Great House

Toru Dutt   Our Casuarina Tree

Nissim Ezekiel   Background Casually

Kamala Das   The Old Playhouse

ELECTIVE II   **DRAMA**   **CODE 17ME-EN2**

UNIT I

Sophocles   Oedipus Rex

UNIT II

Henrick Ibsen   Hedda Gabler

UNIT III

Luigi Pirandello   Six characters in search of an Author

UNIT IV

Anton Chekov   Cherry Orchard

UNIT V

Vijay Tendulkar   Ghashiram Kotwal

Reference

Bentley, Eric. The Playwright as Thinker: Study of Drama in Modern Times, New York: Harcourt, 1967

Gassner, John. Theatre at the Cross Roads, New York: Holt, 1960

Bogard, Tracis, Ed. Modern Drama: Essays in Criticism, New York: OUP.1965

Steiner, George. The Death of Tragedy, New York: Knopf, 1967

ELECTIVE III   **FICTION**   **CODE 17ME-EN3**

Lloyd C.Douglas   The Magnificent Obsession

Gabriel Garcia Marquez   The One Hundred Years of Solitude

Ameen Merchant   Silent Raga

Nayantra Sahgal   Situation in New Delhi

Kamala Markandaya   Possession

ELECTIVE IV **CODE 17ME-EN4** **NON-FICTION PROSE**

UNIT I

Boswell-Life of Johnson

Cardinal Newman-Idea of a University

UNIT II

Emerson-Self-reliance

Lionel Trilling-Beyond

UNIT III

Bertrand Russell-Science and Society

Carlsagan-Broca's Brain

UNIT IV

Thomas Dequincy-Literature

J.A Simonds-Personal Style

UNIT V

A.P.J Abdul Kalam -Wings of Fire

Reference books

A. Ress, Theodore writing creative nonfiction, Ten Seed Press, 2001

Cumberlege, G.F.J Several Essays (second edition), OUP

ELECTIVE V　　　　　　　　**TRANSLATION STUDIES**　　　　　　**CODE 17ME-EN5**

UNIT I

Central Issue-Language and Culture- Types of Translation (pp. 11-23)

UNIT II

Problems of Equivalence - Loss and Gain - Untranslatability - Science or Secondary activity?

UNIT III

History of period study- The Romans-Bible Translation -Education and the Vernacular-Early

Theorists (pp 45-59)

UNIT IV

The Renaissance-The seventeenth century-The eighteenth century -Romanticism- Post -Romanticism-The Victorians -Archaizing-The Twentieth century (pp 60-78)

UNIT V

Specific problems of literary translation -Structures -Poetry and translation -Translating prose -Translating texts in vernacular languages (pp 79-131)

Reference

Susan Bassnett, Third edition. Translation Studies, London and New York: Routledge.

Newmark, Peter. A Textbook of Translation, London and New York: Prentice-Hall, 1988.

Steiner, G After Babel: Aspects of Language and Translation. oxford: The University Press, 1975.

Dr.Kalyani - Translational Studies

ELECTIVE VI   **ENGLISH LANGUAGE TEACHING**   **17ME-EN6**

UNIT I

1. Major language trends in twentieth-century language teaching (Jack C. Richards & Theodore

S. Rodgers, 1-71)

2. Alternative approaches and methods (Jack C. Richards & Theodore S. Rodgers, 7-150)

3. Current communicative approach (Jack C. Richards & Theodore S. Rodgers, 151-256)

UNIT II

1. Background to second language acquisition research and language teaching (Vivian Cook, 1-17)

2. Second language learning and language teaching styles (Vivian Cook, 235-272)

UNIT III

1. An introduction to research methods and tradition (David Nunan. 1-23)

2. The experimental method (David Nunan 24-51)

3. Classroom observation and research (David Nunan, 91-114)

4. Elicitation techniques (David Nunan, 136-158)

5. Doing research (David Nunan, 211-228)

UNIT IV

1. Managing teaching through virtual learning environment (Tony Erben, 166-171)

2. The potential of technology for language learning (Carol A Chapelle, 35-67)

3. Evaluating language teaching (Carol A Chapelle, 69-96)

UNIT V

1. Teaching, listening, speaking, writing and vocabulary (Caroline T.Linse, 21-135)

2. Assessing (Caroline T.Linse, 137-162)

3. Testing in language classes (Desmond Allison, 61-94)

4. Evaluation procedures and instruments (Desmond Allison, 95-113)

Prescribed Text:

1. Approaches and methods in language teaching (Second edition) by Jack C. Richards & Theodore S. Rodgers, Cambridge University Press, 2001

2. Second language learning and language teaching (Fourth edition) by Vivian Cook, Hodder Education, London, 2008

3. Research methods in language learning by David Nunan, Cambridge University Press, 1992

4. Practical English language teaching: Young Learners by Caroline T. Linse, McGraw Hill Companies Inc. New York, 2005

5. Teaching English language learners through technology by Tony Erben, Ruth Ban, Martha

Castaneda, Routledge publication, New York 2009

6. English language learning and technology by Carol A Chapelle, John Benjamin's Publishing Co, Philadelphia, 2003

7. Language testing and evaluation - an introductory course by Desmond Allison, Singapore

University press 1999.

ELECTIVE VII   **POST COLONIAL LITERATURE**   **CODE 17ME-EN**

UNIT I

1. Shairi   -1 Wandered in a Certain Town

2. Gabriel Okara.   - The Mystic Drum

3. P.K. Page   -First Neighbours

4. Shaw Neilson   -To a Blue Flower

5. Judith Wright   - Woman to Man

UNIT II

1. Ngugi Wa Thiongo - Decolonizing the Mind

2. Homi Bhabha   - The other Question

UNIT III

1. Chinua Achebe -A Man of the People

2. Jeannette Armstrong - Whispering In the Shadows

UNIT IV

1. Patrick White - Voss

2. Nayanthara Sahgal - Rich Like Us

UNIT V

1. Wole Soyinka -A Dance of the Forests

2. Mahesh Dattani -Muggy Night in Mumbai

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS)

VELLORE-2

DEPARTMENT OF ENGLISH

I BA/B.Sc/B.Com/B.B.A-FOUNDATION ENGLISH

SEMESTER 1   **CODE 17UIFE1**

UNIT I   POETRY

1. La Belle Dame Sans Merci-John Keats

2. Fame and Friendship-Henry Austin Dobson

UNIT II   PROSE

1. I Have Dreams - Martin Luther

2. Coffee Worries -R.K.Narayan

UNIT III   SOFT SKILLS

1. Listening skills.

UNIT IV   GRAMMAR

1. Parts of Speech

2. Simple Present Tense

3. Present Continuous Tense

4. Present Perfect Tense

5. Present Perfect Continuous Tense

UNIT V   LETTER WRITING

1. Write a requisition letter to the principal to obtain TC.

2. Write a requisition letter to make name correction in the Degree Certificate

3. Write a requisition letter to the Controller of Examinations for correction in the mark sheet.

4. Write a requisition to the principal to recommend your name for Special Scholarship.

5. Write a letter to the principal to get a Bonafide Certificate.

6. Write a letter to the principal to get a Course Completion Certificate.

SEMESTER II   **FOUNDATION ENGLISH**   **CODE 17U2FE2.**

UNIT 1   POETRY

1. If Rudyard Kipling

2. All the World's a stage-William Shakespeare

UNIT II   PROSE

1. University Days - James Thurber

2. Time and the Machine - Aldous Huxley.

UNIT III   SOFT SKILLS

1. Learning Skills.

UNIT IV   GRAMMAR

1. Prepositions and Question Tags

UNIT V   GRAMMAR

1. Simple Past Tense

2. Past Continuous Tense

3. Past Perfect Tense

4. Past Perfect Continuous Tense

5. Simple Future Tense

6. Future Continuous Tense

7. Future Perfect Tense

8. Future Perfect Continuous Tense

SEMESTER III   **FOUNDATION ENGLISH**   **CODE 17U3FE3**

UNIT I   SHORT STORY

1. The Face of Judas Iscariot - Bonnie Chamberlain

2. The White Flower - R.K. Narayanan

UNIT II   SCENES FROM SHAKESPEARE

1. Funeral Oration - *Julius Caesar*-Act Three Scene - III.

2. Patterns of Love- Act Four Scene - 1.

UNIT III   SOFT SKILLS

1. Team Work Skills.

UNIT IV   GRAMMAR

Active and Passive Voices - Exercises

UNIT V   COMMUNICATIVE SKILLS

1. SMS words

2. Electronic Correspondence.

3. Notices, Agendas and Minutes.

SEMESTER IV   **FOUNDATION ENGLISH**   **CODE 17U4FE4**

UNIT I   SHORT STORY

1. The Tell-Tale Heart - Edgar Allan Poe

2. Two Gentlemen of Verona - A.J. Cronin

UNIT II   SCENES FROM SHAKESPEARE

1. He Kills Sleep-*Macbeth* Act One - Scene VII and Act Two Scene - II

2. Trial for a Pound of Flesh *The Merchant of Venice*-Act Four Scene 1

UNIT III   SOFT SKILLS

1. Non-Verbal Communication Skills.

UNIT IV   GRAMMAR

1. Articles, Modals and Auxiliary Verbs.

UNIT V   COMPREHENSION

Comprehension: From Known passage - text.

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS)
VELLORE - 2
B.A. HISTORY
HISTORY OF INDIA UPTO 300 AD

Code : 17U1HS-1

Unit : I

The effects of Geography on Indian History-Sources-Pre and Proto Historic Culture-Indus Valley Civilization - Origin - Date- Extent- Important characteristics- Decline.

Unit : II

Coming of the Aryans-Early and Later Vedic periods-Political Institutions- Social and Economic Organizations-religious beliefs-Vedic literature-Comparison between Indus Civilization and Vedic Culture.

Unit : III

Pre Mauryan India –Rise of Jainism and Buddhism- Rise of Magadha- Sisunaga-Nanda - Persian and Macedonian invasions.

Unit : IV

Mauryan Age - Sources- Chandragupta Maurya- Bindusara – Asoka - His Policy of Dhamma - Asoka and Buddhism - Successors of Asoka- Decline of Mauryan Empire-Mauryan Administration- Social and Economic Conditions- Arts.

Unit : V

The post Mauryan period- Sungas and Kanvas –Greeks – Sakas - Parthians-Kushan invasions-Kanishka- Mahayanism-Society and Economic Organisation - Gandhara Art- Satavahanas.

Books for Reference

1. V.D.Mahajan   : Ancient India
2. G.Thangavelu   : History of India, Vol I & II (Tamil)
3. A.L.Bashyam   : The Cultural History of India.
4. R.C. Majumdar and others : Advanced History of India

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE – 2
B.A. HISTORY
HISTORY OF INDIA FROM 300 A.D TO 1206 A.D

Code : 17U1HS-2

Unit : I

The Age of the Guptas-Sources –Samudra Gupta- Chandra Gupta II and Kumara Gupta – Their achievements - Administration, Social and Economic life-Classical Age-Huns Invasion – Decline of the Guptas.

Unit : II

The Age of Harshavardhana – His Wars – Extent of his empire – Religious Policy – As a man of letters – Nalanda University – Social and Economic Conditions.

Unit : III

History of Deccan – The Chalukyas and the Rashtrakutas – Their Services to Religion, Literature,Art and Architecture.

Unit : IV

Post - Harsha Age – Arab Invasion of Sind – Rajput Kingdoms - Society and Culture – Chalukyas of Vengi.

Unit : V

Turkish Invasion – Mahmud of Ghazni, Muhammed of Ghor - Causes for Hindu failure.

Books for Reference :

1.V.D.Mahajan : Ancient India

2. K.R. Hanumandhan : History of India, Vol I & II (Tamil)

3. R.Sathinathaiar : Political and Cultural History of India, Vol I

4. R.C. Majumthar and others : Advanced History of India.

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE -2
B.A. HISTORY
OUTLINES OF COMPARATIVE GOVERNMENT – 1

Code : 17U1AHS-1

Unit I

State – Meaning -Definition –Elements of State – State and Government- State and Society-State and Association- Community and Institution- Nation and Nationality- Sovereignty

Unit II

Forms of Government –Aristotle Classification-Monarchy-Aristocracy-Democracy-Direct and Representative Democracy- Unitary and Federal Form of Government-Parliamentary and Presidential Form of Government.

Unit III

Constitution – Modern Classification –Written and Unwritten- Flexible and Rigid - Salient Features of the Constitutions of USA, England and India.

Unit IV

Rights and Duties-Classification of Rights- The State and Citizenship – Fundamental Rights- Fundamental Duties.

Unit V

Theory of Separation of Power's –The Idea of Montesquieu - Its application in Modern Constitution.

Books for Reference :

1. Finer   : Theory and Practice of Modern Government
2. V.D.Maharjan   : Selective Modern Government.
3. C.F.Strong   : Modern Political Constitution.
4. Ramasamy   : Comparative Government (Tamil)
5. Anup Chand Kapoor : Principles of Political Science

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE – 2
B.A. HISTORY
ENVIRONMENTAL STUDIES

Code : 17U1ENV

Unit-I: INDRODUCTION TO ENVIROMENTAL SCIENCES: NATURAL RESOURCES:

Environmental Science – Relevance – Significance –Public awareness - Forests resources – Mineral resources – conflicts over resource sharing – Exploitation – Land use pattern – Environment impact –fertilizer – Pesticide problems – case studies.

Unit-II: ECOSYSTEM, BIODIVERSITY AND ITS CONSERVATION:

Ecosystem – concept –structure and function – producers, consumers and decomposers – Food chain – Food web – Ecological pyramids – Energy flow – Forest, Grassland, desert and aquatic ecosystem. Biodiversity – Definition – genetic, species and ecosystem diversity – Values and uses of biodiversity – biodiversity at global, national (India) and local levels – Hotspots, threats to biodiversity – conservation of biodiversity – Inside& Exsitu.

Unit6-III: ENVIRONMENTAL POLLUTION AND MANAGENT

Environmental Pollution – Causes – Effects and control measures of Air, Water, Marine, soil, solid Waste, Thermal, Nuclear Pollution and Disaster Management – Floods, Earth quake, Cyclone and Landslides. Role of individuals in prevention of pollution – case studies.

Unit-IV: SOCIAL ISSUES – HUMEN POPULATION

Urban issues –Energy – water conservation – Environmental Ethics – Global warming – Resettlement and Rehabilitation issues – Environmental legislations – Environmental protection Act.1986 – Air, Water, Wildlife and Forest Conservation Act. Population growth and Explosion – Human rights and Value Education – Environmental Health – HIV/AIDS – Role of IT in Environment and Human Health – Women and child welfare – Public awareness – Case studies.

Unit-V : FIELD WORK

Visit to a local area / local polluted site / local simple ecosystem – Report submission

Books for Reference:

1. Kumarasamy, K., A.Alagappa Moses and M.Vasanthy, 2004. Environmental Studies, Bharathidasan University Pub, 1, Trichy

2. Rajamannar, 2004, Environmental Studies, E.V.R. College Pub, Trichy

3. Kalavathy, S, (ED.) 2004, Environmental Studies, Bishop Heber College Pub., Trichy

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE - 2
B.A. HISTORY
HISTORY OF INDIA FROM 1206 A.D TO 1526 A.D

Code : 17U2HS-3

Unit : I

Establishment of Muslim Rule – Slave Dynasty – Qutb –Ud -Din- Aibak – Iltutmish – Raziya – Balban.

Unit : II

Khiljis – Jalal-Ud-Din Khilji – Ala – Ud – Din Khilji – Theory of Kingship – Economic, Religious and Other reforms – Military Exploits.

Unit : III

Tughlaqs – Mohammed – Bin – Tughlaq – His Administrative Measures – Their impact – Feroz Sahah Tughlaq – Timur's Invasion – The Sayyids and Lodis.

Unit-:IV

Administrative System under the Delhi Sultanate – Social and Economic life - Art and Architecture - Bhakti Movement.

Unit : V

Deccan – The Rise and fall of Bahamini Kingdom – Mohammed Gawan – History of Vijayanagar Empire upto Krishnadevaraya (The Sangama, Saluva and Thuluva Dynasties). Administration – Social Life – Religion – Art and Literature.

Books for Reference :

1. Mahajan. V.D   :   Ancient India
2. Majundar R.C. and Others   :   Advanced History of India
3. Sathinathaier. R   :   Political and Cultural History of India
4. Roshan Dalal   :   History of India, Vol I
5. Usman Sheriff   :   Indian History From 1206 – 1707 (Tamil)

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE -2
B.A. HISTORY
HISTORY OF INDIA FROM 1526 A.D TO 1773 A.D

Code : 17U2HS-4

Unit : I

Early Mughals – Babur and Humayun – Afghan interlude – Sher Shah – His administrative reforms - revenue and military reforms.

Unit : II

The Great Mughals – Akbar to Aurangazeb – Political history – Religious Policy of the Mughals –The Deccan and North West Frontier policies- Decline of the Mughals.

Unit : III

Mughals administrative system – Social and Economic Conditions-Development of Art and Architecture.

Unit : IV

Rise of Sikhism and Successors of Guru Nanak – Guru Arjun – Guru Tej Bahadhur and Guru Govind singh – Marathas – Shivaji- Maratha Administration.

Unit : V

The Coming of the Europeans -The Portuguese – The Dutch - Anglo – French Rivalry- The Carnatic Wars – Rise of British Power in Bengal – Robert Clive – Warren Hastings as Governor of Fort of William.

Books for Refrence :

1. Iswari Prasad : Short History of Muslim rule in India
2. Nilakant Sastri K.A : History of India, Part II and III
3. Krishnamurthi V.M : Indian history Vol III
4. Pakkiyanathan L.S : Mugal India and Modern India
5. Usma Sherriff : Indian history from 1206 to 1707 A.D
6. A.L Srivatsava : History of India 1000 1707 A.D
7. A.C Benerjee : New history of mediaval India

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE – 2
B.A. HISTORY
OUTLINES OF COMPARATIVE GOVERNMENT - II

Code : 17U2AHS-2

Unit I

The Executive- Meaning –Real and Nominal- Single and Plural-Selection of Executive-Functions.

Unit II

Legislature –Functions –Unicameral and Bicameral- Composition of Upper House and Lower House- Composition of Legislatures of U.S.A , England – India .

Unit III

Electorate and Representation –The Electorate- Franchise- Excluded Classes-Methods of Elections - Qualifications of Representative - Proportional Representation - Minority Representation.

Unit IV

Judiciary –Importance of Judiciary - Independence of Judiciary – Composition – Powers and Functions – Judiciary in USA, England Switzerland and in India.

Unit V

Political Parties – Single Party System – Bi Party System–Party System in U.S.A& England – Multiple Party System – Multi Party System in India &France – Pressure Groups.

Books For Reference

1. E. Asirvatham	:	Political Theory
2. H.E .Black	:	The Relation of the Executive The Legislature
3. F.G. Castles	:	Pressure Groups and Political Culture
4. C. V. Chandrasekar	:	Political Parties
5. Finer	:	The Theory and Practice of Modern Government
6.A.C. Kaboor	:	Principles of Political Science
7. R.H .Sattor	:	An Introduction to Politics
9. C.F. Strong	:	Modern Political Constitution

MUTHURANGAM GOVERNMENT ARTS COLLEGE
AUTONOMOUS VELLORE - 2
B.A. HISTORY
VALUE EDUCATION

Code : 17U2EV

Unit : I

Value Education – Definition – Relevance to present day – Concept of Human Values –
Self introspection – Self Esteem.

Unit : II

Family Values – Components structure and responsibilities of family – Neutralization of anger – Adjustability – Threats of family life – Status of Women in family and Society – Caring for needy and elderly – Time allotment for sharing Ideas and Concerns.

Unit : III

Ethical Values – Professional ethics – Mass media ethics – Advertising ethics – Influence of ethics on family life psychology of Children and Youth – Leadership Qualities –Personality Development.

Unit : IV

Social Values – Faith Service and Secularism – Social Sense Commitment – Students and Politics, Social awareness, Consumer awareness, Consumer rights and responsibilities – Redressal mechanisms.

Unit : V

Effect of International affair on Values of life - Issue of globalization – Modern Warfare – Terrorism - Environmental Issues – Mutual Respect - Different Cultures - Religions and their beliefs.

Books for Reference :

1. T. Anchukandam and J. Kuttianimathathil (Ed) Grow free live free Krisitu Jyothi publications Bangalore (1995).
2. Mani Jacob (Ed) Resource book for value education. Institute for value education, New Delhi 2002.
3. NCERT, SCERT Dharma Bharti National Institute of peace and value education DBNI, Secundrabad, 2002.

MUTHURANGAM GOVERNMENT ARTS COLLEGE p
(AUTONOMOUS) VELLORE - 2
B.A. HISTORY
HISTORY OF INDIA FROM 1773 A.D TO 1885 A.D

Code: 17U3HS-5

Unit : I

East India Companiy's Administration in India – Warren Hastings - Regulating Act of 1773- Lord Cornwallis – Permanent Land Settlement - Charter Act of 1793.

Unit : II

Lord Wellesley – Mysore wars – Maratha Wars- Company's relations with Indian States – Subsidiary Alliance – Charter Act of 1813.

Unit : III

Lord Hastings – the Gurkha and Sikh Wars – Afghan and Burmese wars.

Unit : IV

Lord William Bentick– Socio – Religious reforms – Charter Act of 1853 – The Great Revolt of 1857 – Ranjith Singh.

Unit : V

India under the Crown – Government of India Act, 1858 – Queen's Proclamation – Indian Council Act 1861 – Lord Lytton and Lord Ripon – Local Self Government – Foundation of Indian National Congress.

Books for Reference :

1. Grover and Grover   : A new look on modern Indian History
2. Sathiyanadha Ayyar   : A text book of Indian History Vol III
3. Sadhasivam .D   : Indian History – III
4. Collmdaves   : A Historical Atlas of peninsula
5. Roshna Dalal   : History of India

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE – 2
B.A. HISTORY
GEOGRAPHY OF INDIA – PAPER- I

Code : 17U3AHS-3

Unit : I

LOCATION, SETTING AND RELIEF FEATURES

Location and size :the boundary of India ,Unity and Diversity – Relief Features of India – The Himalayan Mountain complex – Regional division of the Himalayas – Advantages – Great plains of North India – the Plateau of Peninsular India – The Western and Eastern Mountain Ranges and Costal Plains

Unit : II

RIVERS

Rivers of the Himalayas – The Indus Systems – The Ganga Systems and Brahmaputra - Rivers of Peninsular Plateau – Mahanadi, Godavari, Krishna, Cauvery, Narmadha and Tabti

Unit : III

CLIMATE

Geographical factors affecting the Climate of India – The Monsoon Winds – The major Seasons of India – The Hot Weather seasons or summer – The South – West monsoons or the Rainy seasons– the Seasons of retreating monsoon

Unit : IV

SOIL

Soil formation in Indian condition – Major Soil Type of India – Soil Erosion – Causes for Soil erosion in India – Prevention of soil erosion.

Unit : V

NATURAL VEGETATION

Forests in India – Classification of Indian Forests – Advantages of Forest – direct and Indirect Uses.

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE – 2
B.A. HISTORY
CONSTITUTION OF INDIA, 1950

Code : 17U3HSSB

Unit : I

Framing of the Constitution – Its objectives – Sources of the Constitution – Salient Features of the Constitution.

Unit : II

Nature of the Federal System -Fundamental Rights and Fundamental Duties.

Unit : III

Directive Principles of States Policy –Union Executive – President – Vice-President – Prime Minister – Cabinet.

Unit : IV

Union Parliament – Lok Sabha – Rajya Sabha – Speaker – Deputy Speaker – State Executive – State Legislature.

Unit : V

Relation between Union and State – Supreme Court – High Court – Union Territories.

Books For Reference

1 .G.S. Chabra   - Advanced Study in the History of Modern India.

2 .A. Sreedharan Menon   - History of India part – III

3. A.C. Agarwal.   - Constitutional History of India

4.Grover and Grover   - Constitutional History of India

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE – 2
DEPARTMENT OF HISTORY
NON MAJOR
HISTORY OF INDIAN FREEDOM STRUGGLE: 1857 A.D – 1947 A.D

Code: 17U3HSNM

Unit : I

The Great Revolt of 1857 – Causes, Course and Results – Role of Indian Rulers – Jhansi Rani - Mangal Pande – Nana Saheb – Bahadur Shah II.

Unit : II

India Under the Crown – Government of India Act, 1858 – Queen's Proclamation – Emergence of Nationalism – Birth of Indian National Congress.

Unit : III

Indian National Congress – Period of Moderates and Militants – Birth of Muslim League – Home Rule movement – Rowlatt Act – Jallianwalabagh, 1919.

Unit : IV

Gandhian Era – Non – Cooperation Movement(1920 – 1922) – Simon Commission– Round Table Conferences – Civil Disobedience Movement.

Unit : V

Quit India Movement – Cripps Mission – Wavell Plan – Cabinet Mission – Mountbatten Plan – Partition of India – India's Independence Act, 1947.

Books for Reference :

1. V.D. Mahajan   :   History of India

2. V.A. Smith   :   History of India

3. K.R. Hanumandan   :   History of India (Tamil)

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE -2
B.A. HISTORY
HISTORY OF INDIA FROM 1885 A.D TO 2000 A.D.

Code : 17U4HS-7

Unit : I

Work of Indian National Congress – 1885 – 1905 – Lord Curzon and Partition of Bengal – Swadeshi Movement – Social and Religious Movement – Period of Moderates.

Unit : II

Militant Nationalism – Birth of Muslim League – Minto – Morley reforms . 1909 – Growth of Revolutionary Movement – Home Rule Movement – Lucknow Pact – Rowlett Act, 1919 – Jallianwalabagh Massacre – Montague - Chelmsford Reforms, 1919.

Unit: III

Gandhian Era – Non–Cooperation Movement – Simon Commission – Civil Disobedience Movement – Round Table Conferences – Gandhi – Irwin pact – Government of India Act of 1935 – Quit India Movement– Cripps Mission– Partition and Independence of India, 1947.

Unit : IV

Independence India – Integration of Princely States – Reorganization of Linguistic States – Nehru Era – Lal Bahadur Sastri – Indo – Pak War, 1965 – Indira Gandhi – Internal Emergency (1975 – 77) – Morarjee Desai –Janatha Government–Indira Gandhi (1980 - 84).

Unit : V

Rajiv Gandhi and Changes of Politics – V.P. Singh – P.V. Narasimha Rao – New Economic Policy – Panchayat Raj – Coalition Government at Centre – India in the New millennium.

Books for Reference :

1 Grower and Grower :   A new look on Modern Indian History
2. D.C. Gupta   :   Indian National Movement and Constitutional Development

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS) VELLORE -2
B.A. HISTORY
HISTORY OF TAMILNADU FROM 1311 A.D TO 2000 A.D

Code : 17U4HS-8

Unit : I

Madurai under the Sultans – Tamil Country under the Vijayanagar Rule – Nayaks Rule in Tamil Nadu – Poligar System , Administration – Social and Economic Life – Religion – Literature – Art and Architecture- Tamil Nadu under the Marathas – Administration – Society – Development of religion – Literature – Fine Arts.

Unit : II

Tamil Nadu under the Nawabs – European Settlement – Administration of the Nawabs – South Indian Rebellion – Vellore Mutiny, 1806 - Carnatic Wars.

Unit : III

Tamil Nadu under the British Administration – Revenue – The Ryotwari System – Judiciary – Education – Socio -Economic Conditions – The role of Tamil Nadu in the Freedom movement – Self Respect Movement.

Unit : IV

The Congress rule in Tamil Nadu after Independence – Rajaji – Kamaraj and His contribution – Bakthavatchalam – Price rice and Hindi Agitation- Election of 1967 and Congress Debacle.

Unit : V

Emergence of D.M.K to power – C.N.Annadurai – M.Karunanithi – Emergence of AIADMK to power – Administration of M.G.R and Jayalalitha.

Books for Reference:

1. V.T. Chellam   : History of Tamilnadu
2. Rajayyan . K   : History of Tamilnadu
3. P.Rajaram   : Justice party

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS) VELLORE – 2
B.A. HISTORY
GEOGRAPHY OF INDIA – PAPER- II

Code: 17U4AHS4

Unit : I

AGRICULTURE AND IRRIGATION

Rice cultivation in India – Wheat farming in India – Jower, Pulses, Oil seeds – Commercial crops – Cotton, Jute, Tobacco and Sugarcane. Plantation in India – Tea, Coffee, Rubber – Problems of Indian Agriculture - Irrigation – Necessity of irrigation in India – Canal Irrigation, Well Irrigation, Tube well, Tank irrigation.

Unit : II

MINERAL RESOUCES AND POWER RESOURCES

Mineral – Iron Ore – Manganese – Mica – Bauxite – Copper and Gold. Power Resources– Coal, Petroleum and Nuclear energy.

Unit : III

INDUSTRIES

Factors influencing the location of industries – Iron and Steel Industries – Cotton – Woollen Industries – Jute textiles – Cement Industries – Paper Industries – Leather Industries – Ship Industries – Automobile Industries.

Unit : IV

POPULATION

Causes for the growth of Population – Density of Population – Problems of Population – Solution for the control of Indian Population.

Unit : V

TRANSPORT AND TRADE

Transport – Modes of Transport – Railways – Road–Air Transport – Water, Trade – Internal and External Trade.

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE - 2
B.A. HISTORY
AN INTRODUCTION TO MUSEOLOGY

Code : 17U4HSSB

Unit : I

Museology – Definition – Objects – History of Museum – Museum Education - Activities of Museum.

Unit : II

Types of Museum – Classification of Museum – National - Regional – State – District –Site – private Museums.

Unit : III

Functions of Museum – Security – Storage - Conservation – Preservation – Techniques.

Unit : IV

Museum Administration – Education – Research.

Unit : V

Study of select Museums in India – National Museum Delhi – Government Museum , Chennai – Salar Jung Museum, Hyderabad – Local Museum, Vellore.

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS) VELLORE – 2
DEPARTMENT OF HISTORY
NON MAJOR
AN INTRODUCTION TO TOURISM

Code: 17U4HSNM

Unit : I

Origin – Development of Travel and Tourism –Basic Concepts in Tourism.

Unit : II

Basic Components of Tourism –Scope and Importance of Tourism.

Unit : III

The role of Transport Systems in Tourism – Airways, Railways, Road Transport and Sea Transport.

Unit : IV

Accommodation - Types of Accommodation – Departments and Functions.

Unit : V

Tamil Nadu – Tourism Attractions, Festivals in Tamil Nadu - Music and Dance of Tamil Nadu.

Books for Reference

1 .A.K. Bhatia   : Tourism Development Principles and Practices

2. Acharyaran   : Tourism and Cultural Heritage of India

3. Ramila Chawla   : Travel and Tourism Management

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELORE – 2
B.A. HISTORY
HISTORY OF EUROPE FROM 1453 A.D TO 1789 A.D

Code: 1705HS-9

Unit : I

The Beginning of the Modern Age - Rise of National Monarchies – Geographical Discoveries and their effects - Renaissance – Reformation in Germany – Charles V.

Unit : II

Religious movements of the 16th century – Calvinism – Zwinglianism- Counter- Reformation – Phillip II - Religious wars of the 16th and 17th Centuries – France – Netherlands – Germany.

Unit : III

Rise of Sweden– Gustavus Adolpus – Chares XII, Rise of Prussia – Frederick William, the Great Elector, Absolute Monarchy in France - Henry IV - Richelieu – Mazarin – Louis XIV –Colbert.

Unit : IV

Rise of Russia – Peter, the Great – Catherine, the Great – Enlightened Despots – Frederick, the Great – Austria.

Unit: V

Maria Theresa – Domestic and Foreign Policy – Joseph II of Austria and His Reforms - Enlightened Monorchy in France – Europe at the eve of French Revolution, Germany – France – Austria – Russia – Italy – Prussia– England.

Books for Reference :

1. B.V Rao	:	A History of Europe
2. South Gate	:	A Text Book of Modern European History
3. H.A.L. Fisher	:	A History of Europe.

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE -2
B.A. HISTORY
HISTORY OF EUROPE FROM 1789 A.D TO 1914 A.D

Code : 17U5HS-10

Unit : I

French Revolution- Causes – Course- Results – Napolean I - Internal and External reforms –The Congress of Vienna, 1815 – The Holy Alliance and Quadruble Alliance – Concert of Europe – Era of Metternich.

Unit : II

Revolution of 1830 and 1848 in France and its impacts upon Europe – Nepolean III – His Domestic and Foreign Policy- Third Republic of France and its Problems.

Unit : III

Unification Movements in Italy and Germany – Contribution of Mazzini, Garibaldi and Count De Cavour towards Italian Unification – Otto Edward Leopold Van Bismark – Policy of Blood and Iron – Contribution to German unity.

Unit : IV

Eastern Question – Greek War of Independence – Turko - Egyptian War – The Crimean War – The Treaty of Berlin 1878 -The Young Turk Movement.

Unit : V

The Rivalry in Balkan States – The Balkan Wars of 1912 and 1913- The Tzarist Regime in Russia – Tsar Nicolas II and Russian Revolt 1905 – Germany Betweeen 1871 and 1914.

Books for Reference :

1. A.J.Grant : A History of Europe
2. A.J. Grant and Temperely : The History of Europe in the 19th century
3. C.D.M. Ketelby : A History of Modern Times
4. G. W. South Gates : A Text Book of modern Europen History

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE – 2
B.A. HISTORY
HISTIORY OF U.S.A FROM COLONIES TO 1900 A.D

Code : 17U5HS-11

Unit : I

The Exploration and Discovery of America – Establishment and Administration of British Colonies – American War of Independence – Causes – Millitary operation – The Treaty of Paris – Results -Confederation to Federation.

Unit : II

Federalists and Republicans–Administration of George Washington – John Adams– Administration of Thomas Jefferson -Madison – War of 1812 - Monroe Doctrine and Jacksons Democracy – John Quiency Adams.

Unit : III

Westward Movement and Mexican war – Presidentialship from Van Buran to Buchchanan – The Problems of Slavery – Abraham Lincoln – Civil War Causes –Course - Results.

Unit : IV

Post Civil War - Reconstruction – Problem of Reconstruction – Presidential Reconstruction -Congress Reconstruction – Rise of Big Business – Industrial Revolution– Agrarian unrest – Populist movement- Labour movement – Anti Trust Legislation.

Unit : V

Presidentialship from Johnson to McKinley – America as a World Power – Purchase of Alaska – Relation with Carribean States – Spanish- American War – Open Door Policy.

Books for Reference :
1. Parks.H. B   - The United States of America – A History
2.Hill. C.P   - A History of The United States
3. Rajayyan . K   - History of United States of America

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE -2
B.A. HISTORY
HISTORY OF CHINA FROM 1800 A.D TO 1914 A.D

Code: 17U5HS-12

Unit : I

Manchu Dynasty – Social, Economic and Political Life – Early relations with the West – First Opium war and Second Opium war.

Unit : II

Taiping Rebellion – Foreign Policy of China Between 1860 and 1894 – U.S.A and Russia.

Unit : III

Sino – Japanese Relations upto 1894 A.D – First Sino Japanese war, 1894.

Unit : IV

Hundred Days Reforms – Open Door Policy – Boxer Rebellion - Manchu Reforms .

Unit : V

Empress Dawoger Tsu Hzi – Chinese Revolution of 1911 –Yuan Shi Kai.

Books for Reference

1. Shivkumar and Jain   :   History of Modern China

2. N. Jayabalan   :   History of China

3. P.H.Clyde and B.F Bears   :   Far East

4. F.M. Michel and G.S Taylor :   The Far East and Modern World

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE 2
B.A. HISTORY
CONSTITUTIONAL HISTORY OF INDIA FROM 1773 A.D. TO 1909 A.D.

Code: 17U5HSE1

Unit : I

Regulating Act, 1773 – Circumstances Leading to the Passing of the act
Provisions and Defects of the Act – Dunda's Bill and Fox India Bill 1783 – Pitts
India Act 1784.

Unit : II

The Charter Act of 1793 – Charter Act of 1813 – The Charter Act of 1833 –
The Charter Act of 1853.

Unit : III

Constitutional Development under the Crown – The Queens Proclamation
and Government Act of 1858 – Growth of Local Self – Government.

Unit : IV

The Councils Act of 1861 and 1892 – Circumstances Leading to the
passing of the Act –Provisions of the Acts – Merits and Demerits.

Unit : V

History of Legislature – Growth of Central and Provincial Legislatures
under the Company and the Crown upto 1909 – Powers and Functions of the
Legislatures.

Books for Reference :

1. G.S Chabra   –   Advanced study in The History of Modern India
2. A. Sreedharan Menon   –   History of India Part III
3. A. C. Agarwal   –   Constitutional History of India
4. Grover and Grover   –   Constitutional History of India.

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE -2
B.A HISTORY
PRINCIPLES OF ARCHAEOLOGY – I

Code: 17U5HS-SB

UNIT I

Definition of Archaeology –History of Archaeology in India – Nature and Scope.

UNIT II

Stone Age – Paleolithic – Mesolithic – Neolithic and Chalcolithic in India – South Indian Megaliths.

UNIT III

Exploration and Excavations – Site Survey – Principles and Methods of Excavation –Documentation – Conservation and Museum Display

UNIT IV

Art and Architecture: Pallavas – Cholas – Pandyas – Vijayanagara and Nayaka Art and Architectures.

UNIT V

Paintings and Ceramic Art : Cave Paintings – Temple Paintings – Wall Paintings – Pottery Types –Blackware – Redware – Black and Redware – Painted Greyware – Roman Pottery –Graffity.

Books for Reference

1. Sir John Marshall   : Indus Valley Civilization.
2. S.R.Rao   : Lothel and Indus Civilization
3. K.V.Raman   : Principles and Methods of Archaeology
4. S. Gurumurthy   : Ceramic Tradition in India

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS) VELLORE -2
B.A. HISTORY
HISTORY OF EUROPE FROM 1914 A.D TO 1992 A.D

Code: 17U6HS-13

Unit : I

Political Conditions of Europe at The 20th Century – The First World War – League of Nations – Russian Revolution – Communism –Lenin – Paris Peace Settlement.

Unit - II

Europe Between the Two World Wars – Fascism – Mussolini, Nazism – Hitler – Mustafa Kamal Pasha – Impact of Dictatorship in Europe.

Unit : III

The Second World War – Causes, Course and Results - Formation of U.N.O and its Achievements.

Unit : IV

Europe since 1945- Cold war –Partition of Germany – E.E.C– NATO – SEATO - CENTO - Warsaw Pact.

Unit : V

Disarmament and Arms Control - Re – Unification of Germany – Disintegration of Soviet Union.

Books for Reference :

1. South Gate : A Text book of Modern European History
2. C.J Hayes : Contemporary Europe since 1890
3. S.N Sen : Europe and the World
4. Thilagavathy Jagathisan : European History of Tamil

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE -2
B.A. HISTORY
HISTORY OF U.S.A FROM AD 1900 A.D TO 1992 A.D

Code: 17U6HS-14

Unit : I

The Progressive Era – President T. Roosevelt – William Taft –Woodrow Wilson -14 Points.

Unit : II

America Between The World Wars – American Isolation – Depression Policy –F.D. Roosevelt – Domestic Policy.

Unit : III

Harry Truman – Fair Deal in Action – Eisenhower – John F. Kennedy – Lyndon B Johnson – Nixon – Carter – Regan – Bush(Senior).

Unit : IV

Women in American Society from 1900 to The Present Day – Women Movements to combat Male Chauvinism – Civil Rights Movements (1900 To 1992) – Martin Luther King.

Unit : V

Technological Progress of USA – Military and Space Programme, Foreign Policy of USA from 1945 A.D to 1992 A.D (Cold War , Iraq Invasion of Kuwait).

Books for Reference :

1.Sommeret	- History of United States
2.J.W Oliver	- History of American Technology
3. Miller	- History of the United States
4.Beard and Beard	- New basic History of the United States

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE – 2
B.A. HISTORY
HISTORY OF CHINA FROM 1914 A.D TO 1990 A.D

Code: 17U6HS-15

Unit : I

China and First World War – Twenty One Demands – War Lords – May Fourth Movement – Rise of Chinese Communist Party.

Unit : II

Achivement of Dr. Sun Yat Sen – Rise of Komintang – Achievement of Chiang Kai Shek – Manchurian Crisis.

Unit : III

Second Sino – Japanese war,1937 –Second World War – Civil War Between K.M.T. and C.C.P .

Unit : IV

Mao Tse Tung – Establishment of Peoples Republic of China – Cultural revolution – Internal reforms.

Unit : V

China and Contemporary World – Foreign Policy – Post Mao Period.

Books for Reference :

1.Shivkumar and Jain   : History of Modern China

2.N. Jayapalan   : History of China

3. P.H.Clyde and B.F. Bears   : Far East

4. F.M. Michel and G.S.Taylor : The Far East and Modern World

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE -2
B.A. HISTORY
CONSTITUTIONAL HISTORY OF INDIA FROM 1909 A.D TO 1950 A.D

Code: 17U6HSE-2

Unit : I

Minto Morley Reforms 1909 – Circumstances leading to the passing of the Act – Provisions of the Act – Merits and Demerits of the Act – Impact of the First World War on Constitutional development (1914 – 1919).

Unit : II

Government of India Act of 1919 – Events Leading to the passing of the Act – Provisions of the Act – System of Dyarchy – Simon Commission 1927 – Nehru Report 1928 – Fourteen points of Jinnah 1929 – Civil Disobedience Movement 1930 – Round Table Conferences – White paper report.

Unit : III

Government of India Act of 1935 – Circumstances Leading to the passing Act – The Salient Features – Provincial Autonomy – Federal Legislature – Federal Executive.

Unit : IV

Constitutional development in India from 1939 to 1946 – Cripps Mission, 1942 – Quit India Movement, 1942 – Rajaji Formula, 1944 – Wavel Plan, 1945 – Cabinet Mission, 1946 – Mountbatten Plan, 1947 – Indian Independence Act, 1947.

Unit : V

Republican Constitution of India, 1950 – Salient Features – Directive Principles of State Policy – Fundamental Rights – Legislature – Executive and Judiciary.

Books for reference :

1. Grower and Grower   -   Constitutional History of India
2. Sreedharan Menon   -   History of India - III

MUTHURANGAM GOVERNMENT ARTS COLLEGE, (AUTONOMOUS)
VELORE – 2
B.A. HISTORY
HUMAN RIGHTS

Code : 17U6HSE-3

Unit : I

Theories on Human Rights – Definition – Characterstic of Human Rights – Classification of Rights – Concept of Liberty and Equality.

Unit : II

The Universal Declaration of Human Rights – Preamble – General Assembly – International Covenants on Civil and Political Rights – International Covenants on Economic, Social and Cultural Rights.

Unit: III

Constitutional Guarantee on Human Rights in India – Fundamental Rights – Directive Principles of State Policy – Civil and Political Rights.

Unit : IV

Women 's Rights – Right to Inheritance – Right to Divorce – Right to Remarry – Right to Education – Right to Equality in Training – Employment and in Career Advancement – Child Labour – Bonded Labour – Refugees.

Unit : V

Human Rights and International Organizations – Amnesty International – Human Rights Watch - Asia Watch – Hot Line – Red Cross Movement.

Books for Reference :

1.Inrernational bill of Human Right, Amnesty International Publication, 1988

2.Human Rights, Questions and answers UNESCO – 1982

3.DESAI.A.R. Violation of Democratic Rights in India , Sangam books

4.Pandey, Constitutional Law

5.K.S.Singh, Indian Social Institution

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE -2

B.A HISTORY

PRINCIPLES OF ARCHAEOLOGY - II

CODE : 17U6HS-SB

UNIT –I

Epigraphy – South Indian Inscription – Tamil Brahmi Inscriptions – Asokan Brahmi – Copper Plate – Palm Leaves –

UNIT –II

Iconography – Hindu Iconography – Pallava – Chola – Pandiya and Vijayanagar Sculptures.

UNIT III

Numismatics - Evolution of Coins - South Indian Coins - Sangam - Sathavahanas - Cholas - Pandiyas - Vijayanagar Coins.

UNIT IV

Monuments – Red Fort – Taj Mahal – Vellore Fort-Mahabalipuram .

UNIT V

Museology- Meaning –Definition-Museum Preservation and Conservation – Site Museums in Tamil Nadu.

Books for Reference:

1.A.S.Althiker   : Coin age of South India
2.R. Krishnamurthy   : Roman Coins
3.A.Seetharaman   : Coins of Tamil Nadu
4.Iravadham Mahadevan   : Tamil Brahmi Inscription

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTOOMOUS) VELLORE - 2
B.A. HISTORY
HISTORY OF TAMILNADU UPTO 1311 A.D

Code: 17U3HS-6

Unit: I

Geographical Features of Tamilnadu – Sources – Archaeological – Epigraphical – Numismatic – Literary Evidences- Indians and Foreigners.

Unit : II

Pre – Sangam Period – Sangam Works – History of Sangam – Cholas, Cheras & Pandyas -Social,Economic and Cultural Life of Tamils – Maritime Trade.

Unit : III

Kalabhras – Pallavas – Pandyas of the First Empire – Pallava – Pandya – Chalukya – Rashtrakuta Relations – Social, Economic and Cultural conditions – Bhakthi Movement.

Unit : IV

Imperial Cholas – Administration – Art and Architecture – Literary – Economic, Social and Religious Condition – Chola – Chalukya relation – Chola – Pandya relation and the fall of Cholas.

Unit : V

Second Pandiyan Empire – Chola – Pandya –Ceylonese relation – Foreigner's Account – Muslim Invasion of Tamilagam – Malik Kafur.

Books for Reference :

1. K.A.N. Sastri   : History of South India
2. K. Rajayyan   : History of Tamilnadu
3. N.Subramanian   : Sangam Age – History of Tamil Nadu –Vol I, Vol II
4. K.V. Raman   : Pandiyan History
5. K.K. Pillai   : Social and Culture History of Tamils

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE-2
M.A HISTORY SYLLABUS
SOCIAL AND CULTURAL HISTORY OF TAMILNADU UPTO 1311 A.D

Code: 17P1HS-1

Unit-I

Age of the Sangam - Social Institutions - Customs and Practices - Economic Life – Trade – Religion – Literature – Arts.

Unit - II

Age of the Pallavas - Society – Economic Life – Religion - Literature.

Unit - III

Age of the Pallavas - Role of the Temples – Art and Architecture – Sculptures – Paintings - Bhakti Movement.

Unit - IV

Age of the Cholas - Society – Economic Life – Religion – Role of the Temples – Literature and Education – Art and Architecture.

Unit - V

Age of the Pandyas- Society – Economic Life – Religion – Foreign Accounts – Literature – Art and Architecture.

Books for Reference :

1. Balasubramanian C -The status of women in Tamilnadu during the Sangam Age, 1996.
2. Davanesan A - History of Tamilnadu, Renu Publications, marthandam, 1997.
3. Mahalingam T V - Administration and Social Life under Vijayanagar, Madras, 1940.
4. Dr.Minakshi C - Administration and Social life under the Pallavas, University of Madras, Madras, 1997.
5. Nagaswamy R - Studies in South Indian History and Culture.
6. Nilakanta Sastri K.A - The Cholas, University of Madras, Madras ,1984.
7. Nilakanta Sastri K.A - The Pandyan Kingdom, London,1929.

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE -2
M.A HISTORYY SYLLABUS
SOCIAL AND CULTURAL HISTORY OF INDIA UP TO 600 A.D.

Code: 17P1HS-2

Unit - I

Sources of Ancient Indian History – Pre-Historic Culture - The Indus Valley Civilization and its characteristic features.

Unit - II

Vedic Culture, Social Patterns, Religion –The Later Vedic period, Social and Cultural patterns - Position of women - Caste system - Learning and Literature.

Unit - III

Religious ferment in the 6th Century, Jainism and Buddhism - Repolarisation of society - Bhagavata cult, Vaishnavism , Saivism – Education - Persian and Greek influences on Indian society.

Unit - IV

Age of Mauryas - Social conditions – Literature - Art and Architecture, Ashoka's Dharma - India between 2nd Century B.C and 3rd Century A.D. Brahmanical Cultural revival and Synthesis - Social and Economic condition – Mahayanism - Gandhara and Madhura School of Arts.

Unit - V

The Classical Age : Guptas Cultural Florescence - Art and Architecture (Nagara and Dravida Style) –Temples, Sculptures, Paintings (Ajantha Style) Religion and Education - Foreign Accounts.

Books for reference :

1.Basham,A.L.(ed) : A Cultural History of India, Oxford University Press, New Delhi,2006.

2.Jha,D.N : Ancient India, Manohar publishers, New Delhi,2004.

3.Jayapalan,N : History of Culture, Atlantic Publishers & Distributors, New Delhi, 2001.

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE - 2
M.A HISTORY SYLLABUS
SOCIAL AND CULTRAL HISTORY OF INDIA
FROM 600 A.D TO 1526 A.D

Code: 17P1HS-3

Unit: I

India from 7th to 12th Century A.D - Rajput Society – Culture - Feudalism Religious Philosophies - Society and Culture under Vardhanas, Chalukyas, Rashtrakutas - Contribution to Art and Architecture.

Unit: II

Delhi Sultanate period - Social and Economic condition - Military and Administrative organizations - Change in Economy and Society - Urban centers.

Unit: III

Delhi Sultanate period -Trade and Commerce - Peasants and Artisans -New Crafts, Industry and Technology - Unani Medicines - Evolution of Indo - Persian Culture - Literature, Art and Architecture.

Unit: IV

Impact of Islam on Indian Society - Cultural contributions of the Yadavas, Kakatiyas, Hoysalas - Economic and Cultural contribution of the Deccan Sultans- Social and Economic life - Art and Architecture.

Unit: V

Social and Cultural life under Vijayanagar rule - Cultural contribution - Art and Architecture - Religious Movement of 15th and 16th Centuries.

Book for Reference:

1.Chandra,Satish : Essays on Medieval Indian History, Oxford University Press, New Delhi,2004.

2.Chanra, Satish : Medival India from Sultanate to Mughal- Part-I, 1206-1526,Haranand Publications, New Delhi,1975.

3.Habib and Nizami : Delhi Sultanate, Indian History Congress Publications, New Delhi,1970.

4.Luniya,B.N : Indian History and Culture, New Delhi,1980.

5.Mahajan,V.D : History of Delhi Sultanate, Sultan Chand, New Delhi,2000.

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE -2
M.A HISTORY SYLLABUS
CONTEMPORARY HISTORY OF INDIA FROM 1947 A.D TO 1977 A.D

Code: 17P1HS-4

Unit-I

National Consolidation - Making of Constitution - Integration of Indian States- Re-Organisation of Linguistic States.

Unit-II

Democratic Socialism - General Election of 1952 - Jawaharlal Nehru as First Prime Minister - Economic policy - Five Year Plans - Land Reforms - Social Reforms, Educational development, Science and Technology.

Unit-III   India's Foreign Policy Under Nehru:

NAM - Panchashell - Bandung Conference - U.N Common Wealth - India's relationship with other countries - India and US - India and USSR - India and Britain- India and Pakistan - India and China- War of 1962 – Lal Bahadur Sastri 1964-66 - Economic Reforms - Indo Pak War of 1965.

Unit -IV

Emergence of Indira Gandhi- General Election of 1967- Split in Congress- Removal of Poverty-Nationalization- Accession of Sikkim- Position of Goa- Official Languages Act 1967.
Foreign Policy: Indo Pak war of 1971-India and USA-India and USSR-India and NAM.

Unit -V

The Authorisation Interlude - Emergency and Politics- Causes-Repression of the Movement-Jayaprakash Narayanan- 20 Points Programme – General Election of 1977.

Books for Reference :

1.Krishnan Bhatia : A Social Study of India since Independence 1947-1970
2.Deshmukh   : Economic Development of India 1946-1956
3.Frankel.R   : India's political Economy 1947-1977

Code: 17P1EHS

Unit-I

India's Foreign Policy - Distinct Features - Jawaharlal Nehru & His Policy towards Neighbouring Countries.

Unit-II

India and Pakistan - Partition and its Problem - Kashmir Issue - Water Dispute - Raan of Kutch - War of 1965.

Unit-III

India and China - Chinese Hard Line Policy – Panchasheel - Tibet Issue - Difference over Boundary Issue -War of 1962.

Unit-IV

India and Sri lanka - Nature of the Relation- The Major Issues and Problems - Indo - Ceylon Agreement 1954 - Shastri Srimavo Pact 1964 - Ethnic Problem.

Unit-V

India and Nepal -India and Burma -India and Maldives - India and Bhutan – NAM - India' s Role in NAM.

Books for Reference

1.Bipan Chandra et.al, : India After Independence, 1947-2000. Penguin Books, New Delhi, 2000.
2.Chaitanya,Mishra:"Indo-Nepal Relations: A View from Kathmandu", Sage Publications, New Delhi, 1993.
3.Dixit, J.N. : Indian Foreign Policy and Its Neighbours, Gyan Publishing House, New Delhi, 2001.
4.Deb Arinda : Bhutan and India : A Study in Frontier Political Relations.
5.Muhammed Shamsul Haq : Bangladesh in International Politics, Sterling Publishers, 1993.
6.Nanda, B.R(ed) :Indian Foreign Policy : The Nehru Years.

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE -2
M.A HISTORY SYLLABUS
SOCIAL AND CULTURAL HISTORY OF TAMILNADU : 1311-2000 A.D

Code : 17P2HS-5

Unit-I

Tamilagam under the Vijayanagar and Nayak Rule – Society - Economic life –Religion - Literature – Arts and Fine Arts.

Unit- II

Tamilagam under the Marathas - Society-Economic life – Religion – Literature - Arts and Fine Arts - Religion in Modern Tamilagam- Christianity - Hindu revival-Secularism.

Unit-III

Reform Movements in Modern Tamilagam - Social Reform Movements - Self-Respect Movement - Women Movements in Tamil Nadu- Social Legislations - Nationalist Upsurge.

Unit-IV

Education in Modern Tamilagam - Introduction of Western Education - Higher Education - Educational Policy - Development of Science and Technology and Professional Education.

Unit-V

Literature, Arts and Fine Arts in Modern Tamilagam - Tamil Renaissance - Development of Arts-Fine Arts.

Books for Reference

1.Chellam,V.T :Thamizhaga Varalarum Panpadum(in Tamil), Manivasagar Pathipagam, Chennai, 2005.
2.Hardgrave, R., : The Dravidian Movement, Popular Prakashan, Bombay, 1965.
3.Pillay.K.K., : A Social History of the Tamils, University of Madras, Madras,1969.
4.Sathianadhan ,S : History of Education in the madras presidency, Madras, 1894.

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE-2
M.A HISTORY SYLLABUS
SOCIAL AND CULTURAL HISTORY OF INDIA
FROM 1526 A.D TO 1857 A.D

Code: 17P2HS-6

Unit-I

India under the Mughals - Social and Economic conditions - Land revenue system - Agriculture and Agrarian society - Trade and Commerce – Religion - Culture - ruling class -Mansabdars, Jagirdars, Zaminadars - Peasants-Status of the Women - Life in Towns, Cities and Villages.

Unit-II

Mughal Education-Arts and Architecture, Painting Literature & Music under the Mughals.

Unit-III

Age of Religious Reformers - Emergence of Sikh religion and Culture - Bhakthi movement - Muslim Mystic Movements(Sufism) - Reformer saints(Nanak, Kabir, Ramananda)- Vaishanavist Revival Movements - Hindu - Muslim Cultural synthesis.

Unit-IV

Mughals Foreigners Accounts - Bernier, Tavarnier and Manucci - Social and Cultural History of Marathas.

Unit-V

European Penetration-Rediscovery of India's past-Growth of Indology-Social and Cultural policy of the East India Company-Policy of Non-Interference-Activities of Christian Missionaries-Growth of Humanitarianism

Books for Reference :

1.Bose,M.L: Social and Cultural History of India, Concept Publication , New Delhi, 1989.

2.Basham, A. (ed): A Cultural History of India, Oxford University Press, New Delhi,2006.

3.Chopra, Puri &Das: A social, Cultural &Economic History of India, Macmillan Publication, New Delhi,1992.

4.Desai,A.R: Peasant - Struggle in India, S.Chand & co,Chennai,1980.

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE-2
M.A HISTORY SYLLABUS
SOCIAL AND CULTURAL HISTORY OF INDIA
FROM 1857 A.D TO 1947 A.D

Code: 17P2HS-7

Unit-I

Queen's Proclamation - Racial Antagonism of the rulers improvement of the Peasants - Ruin of Artisans and Craftsman - Poverty and Famine, Development of Education - Spread of Western Education - Its impact on Indian Society.

Unit-II

Renascent India-The 19th Century Renaissance - Social and Cultural Aweaking - Hindu Reforms and Movements - Brahmo Samaj, Prathana Samraj, Arya Samraj, Ramakrishna Mission, Theosophical Society - Muslim Reformist Movements: Aligarh movements - The Dar UI - Ulum Deoband, Ahmadiya Movement - Religious Reforms among the Paris and Sikhs.

Unit-III

Growth of New India - Social Reforms in the Second Half of the 19th Century - Emancipation of Women - Regeneration of Indian Society - Caste Movements with reference to Maharashtra, Kerala and Andhra-Civil Rebellions; Peasant Revolts, Deccan riots, Mopilla Uprising - Tribal revolts in Central and Eastern India.

Unit-IV

The Freedom Struggle - Social Background of Indian National Movement - Emergence of New Social Classes - Role of Thinkers, Writers. Women and Youth in the National Movement.

Unit-V

Free India - Social Change through Constitutional Safeguards - Strategy for the Development of Scheduled Caste, Scheduled Tribes, Backward Classes and Minorities.

Books for Reference :
1.Chandra, Bipin   :India's Struggle for Independence
2.Chandra, Bipin   :India Since Independence
3.Majumdar, R.C, Raychudhari,H.C and Kalinkar Datta   :An Advanced History of India
4.Jones, Kenentah.W   :Socio-Religious Reforms Movement in British India
5.Sarkar, Smith Charker : Mordern India 1885-1947

Code: 17P2HS-8

Unit-I

Rise and fall of Janatha party (1977-79)- Genaral Election of 1977-Morarjee Desai - Charan Singh-Indira Gandhi(1980-1984)- Internal reforms- Kalistan Movement-Operation Blue Star- Foreign Policy of Indira Gandhi- Development of Science and Technology since 1977.

Unit-II

Rajiv Gandhi(1984-1989)-Internal Reforms, New Economic Policy- Assam Accord- Rajiv Longoval Agreement 1985-Techonology Mission-New Education Policy-Shah Banu Case- Muslim Women's Bill 1986-Bofars Affairs, Fairfox Controversy-Babur Masjid affairs- Democratic De-Centralization- General Election of 1989.

Unit-III

Rajiv Gandhi's Foreign Policy- Non Align Movement- Indo US relation- India and USSR (10Ppoint Declaration)- India and Pakistan- India and China- India and Bangladesh- India and Srilanka - The role of India in SAARC.

Unit-IV

National Front 1989 to 1991- Genaral Election of 1989- V.P.Singh (1989 to 1990) Internal Reforms-Kashmir Problem- Punjab Problem- Bofors Controvercy- Reservation Policy-Mandal Commission Report-Babur Masjid Problem- Abolition of the Govt- Chandra Sekar as P.M-New Cabinet- Internal and External reforms- Govt Dissolve Assassination of Rajiv Gandhi-Poverty and its impact.

Unit-V

Congress Rule 1991 to 96-Tenth Genaral Election of 1991 -P.V.Narasimha Rao-Minority Govt-Cabinet-New Economic Policy- Dr. Man Mohan Singh-Globalisation - Liberlisation- Privatisation Cauvery Water Dispute- Ram Babur Masjid Problem-Demolition of Babur Masjid 1992-Its impact-New Panchayat Reforms-Reservation-P.V. Narasimha Rao's Foreign Policy: India and USA: India and USSR: India and China: India and Pakistan : India and Bangladesh : India and Sri Lanka. Demographic Trends- Deforesation and its impact.

Books for Reference:
1.Krishnan Bhatia   : A Social Study of India Science Independence 1947-70
2.Deshmuukh.C.D.   : Economic Development of India 1946-1956
3.Frankel.R   : Indias Political Economy 1947-1977
4.Kuldip Nayar   : India After Nehru5.India Year Book'2004'   : Ninth & Tenth Plan
Budget-Yogna

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE – 2
M.A HISTORY SYLLABUS
INDIA & HER NEIGHBOURS : 1966 A.D-2000 A.D

Code: 17P2EHS

Unit-I

India and Pakistan – Tashkant Declaration 1966 - War of 1971 and its Impact – Simla Pact 1972- India's Nuclear Test and Reaction of Pakistan - Pakistan's Offer of No War Pact - Water Dispute -Kashmir Problem -Clashes in Siachen - Kargil War.

Unit-II

India and China– Period of Normalisation - Janata Rule and China - Vajpayee's Beijing Visit (1978) - Sino Indian Talk 1985 - Sino Indian Relations Since 1985.

Unit-III

India and Bangladesh - India's Role in the Emergence of Bangladesh - Indo Bangladesh Treaty of Friendship 1972- Border Agreement 1974- Farraka Issue - Agreements on Farraka - Controversy over New Moore Island – Indo Bangladesh Ganga Water Accord 1985 - Problems in Border Demarcation .

Unit-IV

India and Sri Lanka – Ethnic Crisis –Tamil Liberation Movements - Rajiv Gandhi Jayawardhana Pact - The Role of Indian Peace Keeping Force(IPKF) - Katchadevu Issue .

Unit-V

India and Burma –India and Nepal -India and Maldives -SAARC- Role of India in SAARC.

Books for Reference

1.Bipan Chandra et.al, : India After Independence, 1947-2000. Penguin Books, New Delhi, 2000.
2.Chaitanya, Mishra :"Indo-Nepal Relations: A View from Kathmandu", Sage Publications, New Delhi, 1993.

Muthurangam Govt Arts College(A), Vellore-02.
Human Rights
(Compulsory paper for all PG Degree Course)

Unit-I

Theories on Human Rights-Definition-Classification- Characteristic of Human Rights-Historical Development of Human Rights.

Unit-II

Human Rights and UNO – Universal Decelerate of Human Rights – International covenant on civil and political rights, 1966 – International covenant on economic, social and cultural rights – optional protocol.

Unit-III

Constitutional Guarantee on Human Rights in India – Fundamental Rights – Directive Principles of state policy –National human rights commission- State Human Rights commission.

Unit-IV

Human Rights and International Organizations – Amnesty International - Helsinki process- Asia watch – European Human Rights System – African Human Rights- Hot line.

Unit –V

Contemporary issues on Human Rights- Bonded Labour –Child Labour – Refugees-capital punishment –Women's rights –Children's rights.

Books for Reference:-

M.A HISTORY SYLLABUS
HISTORY OF WORLD CIVILIZATION
(EXCLUDING INDIA) - ANCIENT PERIOD

Code: 17P3HS-9

Unit-I

Introduction - Definition of Civilization - Comparison between Culture and Civilization - Origin and Growth of Civilization - Pre-Historic Culture - Paleolithic and Neolithic Culture.

Unit-II

River Valley Civilizations - Egyptian Civilization - Mesopotomian Civilization -Sumerian and Babylonian Civilization - Their contributions to the Civilization.

Unit-III

Assyrian, Chaldean and Persian Civilizations.

Unit-IV

Hebrew Civilization – Greek Civilization – Their Religions - Literature and Philosophy.

Unit-V

Ancient Roman civilization - Chinese civilization- Religion– Government – Society – Economic and Law.

Books for Reference :

1.Burns, Ralphetal : Western Civilizations
2.Brinton, Chirstopher, Wolf : A History of Civilization, Vol I & II, Prentice-Hall, Inc, Engle Winks. Wood, New Jersey, 1984.
3.Edward D'Cruz, S.J : A Survey of World Civilization, Lalvani Publishing House.
4.Edward Macnall Burns : Western Civilization-Their History and Their Culture.
5.Gokhale, B.K, : Introduction to Western Civilization, S. Chand & Co, Pvt. Ltd, New Delhi, 1973.

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE-2
M.A HISTORY SYLLABUS
HISTORY OF EUROPE FROM 1789 A.D TO 1914 A.D

Code: 17P3HS-10

Unit-I

French Revolution - Causes-Course-Results-Era of Napolean -The Congress of Vienna, 1815-The Holy Alliance and Quadruble Alliance-Concert of Europe-Era of Metternich.

Unit-II

Revolution of 1830 and 1848 in France and its Impacts upon Europe-Nepolean III –His Domestic and Foreign Policy-Third Republic of France and its problems.

Unit-III

Unification Movements in Italy and Germany-Contribution of Mazzini, Garibaldi, Count-De-Cavour towards Italian Unification-Otto Edward Lepold Van Bismark-Policy of Blood and Iron- His contribution to Germany.

Unit-IV

The Eastern Questions-Greek War of Independence-Turko-Egyptian War-The Crimean War-The Treaty of Berlin,1878-The Young Turk Movement-The Rivalry in Balkan States-The Balkan Wars of 1912 and 1913.

Unit-V

The Tzarist Regime in Russia – Tsar Nicolas II and Russian Revolt, 1905-Germany Between 1871 and 1914- Circumstances Leading to the outbreak of The First World War.

Books for Reference :

1.A.J.Grant   :   A History of Europe
2.A.J.Grant and Temperely   :   The History of Europe In The 19th Century
3.C.D.Ketelby   :   A History of Modern Times
4.G.W.South Gates   :   A Test Book of Modern Europe
5.Ragubir Dayal   :   Modern Europe

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE-2
M.A HISTORY SYLLABUS
HISTORY OF U.S.A.1900 A.D TO 1953 A.D

Code : 17P3HS-11

Unit-I

Progressive Era - Theodore Roosevelt and Square Deal Policy - Big Stick Policy - William Taft - Dollar Diplomacy.

Unit-II

Woodrow Wilson - New Freedom - Role of U.S.A in the First World War - 14 Points of W. Wilson - League of Nation.

Unit-III

Waren Harding - Washington Conference – Coolidge – Hoover - Great Depression 1929.

Unit-IV

F.D. Roosevelt - New Deal Policy and Foreign Policy – Role of U.S.A. in Second World War - UNO.

Unit – V

Harry S. Truman Domestic and Foreign Policy – Cold war – Truman Doctrine – Marshal Plan – NATO.

Books for Reference :

1.Sommeret	-	History of United States
2.J.W Oliver	-	History of American Technology
3. Miller	-	History of the United States
4.Beard and Beard	-	New basic History of the United States

MUTHURANGAM GOVERNMENT ARRS COLLEGE
(AUTONOMOUS) VELLORE-2
M.A HISTORY SYLLABUS
HISTORICAL THEORY AND HISTORIOGRAPHY

Code: 17P3HS-12

Unit-I

Meaning – Kinds of History - History is a Science or an Art – Does History repeats itself - History and Its Allied Subjects.

Unit-II

History and other Social Sciences- History and Geography- History and Economics - History and Politics - History and Sociology - History and Psychology - History and Literature- History and Biology- History and Ethics- Uses and Abuses of History.

Unit-III

Philosophy of History- Various Theories of History- Historical Determinism and Relativism.

Unit-IV

History of Historical Writing- Greek Historiography- Roman Historiography- German Historiography- British Historiography.

Unit-V

Indian Historiography- Ancient India - Bana, Bilhana, Kalhana- Medieval India - Alberuni, Ferishta, Ibn Batuta, Abul Fazl- Modern India - Krishnaswami Iyengar, Nilakanda Sastri, Majumdar and V.A.Smith.

Books for Reference :
1.Srivastava.A.N & Majumdar : Historiography
2.Rajayyan.K : History in Theory and Method
3.Carr.E.H. : What is History, Penguin Books, London 1982
4.Subramanian,N : Histography and Historical Method. Udumalpet.1993
5.Collingwood.R.G : The Idea of History-Literature and Education-Art and Architecture

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE-2
M.A HISTORY SYLLABUS
HISTORY OF JAPAN FROM 1894 A.D TO 1970 A.D

Code: 17P3EHS

Unit-I

First Sino- Japanese War- Anglo-Japanese Alliance , 1902-Russo- Japanese War, 1904-05.

Unit-II

Political Development in Japan-Japan and First World War-Twenty One Demands- Treaty of Versailes- Washington Conference.

Unit-III

Japan between two World Wars - Economic and Financial Condition During the inter war Period-Manchurian Crisis-Sino-Japanese relations from 1932 to 1937- Rise of Militarism in Japan- Second Sino Japanese War.

Unit-IV

Japan in the Second World War - Allied occupation of Japan-Political. Social and Economic Changes- San Francisco Treaty.

Unit-V

Japan after 1951-Social and Economic Development- Foreign policy of Japan from 1951 to 1970- Japan in the World Affairs.

Books for Reference :

Andrew Gordon	:	A Modern History of Japan
James, David. H	:	The Rise & Fall of Japanese Empire
Vinacke, Harold Times	:	A History of The Far East in Modern
Singh .A.K	:	History of Japan in Modern Times.

MUTHUNGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE-2
M.A HISTORY SYLLABUS
HISTORY OF WORLD CIVILIZATION(EXCLUDING INDIA)
MEDEIVAL AND MODERN PERIOD

Code: 17P4HS-13

Unit-I

Feudalism - Origin - Merits and Demerits – Christianity - Monastic orders - Byzantine Civilization – Islam - Its Principles - Saracenic Civilization.

Unit-II

Rise of Towns - Medieval Cities - Medieval Universities – Education – Crusades - Causes and Results.

Unit-III

Renaissance - Its Impact- Geographical Discoveries - Reformation- Germany, France and Switzerland – Counter - Reformation.

Unit-IV

French Revolution and Its impact – Romanticism - Industrial and Agrarian Revolutions - Causes, Course and Results.

Unit-V

League of Nations - United Nations Organisation – Science, Technology, Philosophy, Art and Literature during the Contemporary World.

Books for Reference :

1.Burns   : Western Civilization
2.Edward Macnall   : Western Civilization
3.Gokhale, B.K   : Introduction to Western Civilization, S. Chand & Co, Pvt. Ltd, New Delhi.1973
4.Phul, R.K.   : World Civilization
5.Swain, J.E   : A History of World Civilization
6.Toynbee ,A.J   : A Study of History(12 Volumes)
7.Weech   : World Civilization

Code: 17P4HS-14

Unit-I

Political conditions of Europe at the 20th Century- The First World War- League of Nations- Russian Revolution- Communism- Lenin - Paris Peace Settlement .

Unit-II

Europe Between Two World Wars - Fascism- Mussolini-Nazism - Hitler- Mustafa Kamal Pasha - Impact of Dictatorship in Europe.

Unit-III

Second World War – Causes , Course and Results – Formation of U.N.O and Its achievement.

Unit-IV

Europe since 1945 - Cold War - Partition of Germany - E.E.C - NATO - SEATO - Warsaw Pact.

Unit-V

Re-unification of Germany - Disintegration of Soviet Union- Development of Science and Technology.

Books for References:

1.South Gate	:	A Text Book Modern Europe
2.C.J.Hayes	:	Contemporary Europe Since 1890
3.S.N.Sen	:	Europe and The World
4.V.M.Krishnamoorthy	:	Europe in The Modern World
5.Thilagavathy Jagadesan	:	History of Europe (Tamil)

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE-2
M.A HISTORY SYLLABUS
HISTORY OF U.S.A 1953 A.D TO 2000 A.D

Code : 17P4HS-15

Unit-I

Eisonhower - Domestic and Foreign Policy - SEATO - John F. Kennedy - New Frontier- Foreign Policy - Civil Rights Movements - Martin Luther King.

Unit-II

L.B. Johnson- Great Society - Foreign Policy - Richard Nixon - Watergate Scandal -Ping Pong Diplomacy - Man of the Moon.

Unit-III

Gerold Ford - Domestic and Foreign Policy- Jimmy Carter- Ronald Regan - Domestic and Foreign Policy.

Unit-IV

America under Geroge W. Bush(s) - Bill Clinton - Domestic and Foreign Policy - Geroge W. Bush(J) - Gulf war.

Unit-V

Women in American Society - Technological Progress of U.S.A. Military and Space Programme - U.S.A. and World Affairs.

Books for Reference :

1.Sommeret - History of United States
2.J.W Oliver - History of American Technology
3. Miller - History of the United States
4.Beard and Beard - New basic History of the United States

MUTHURANGAM GOVERNMENT ARTS COLLEGE
(AUTONOMOUS) VELLORE-2
M.A HISTORY SYLLABUS
RESEARCH METHODOLOGY IN HISTORY

Code: 17P4HS- 1.6

Unit-I

Definition- Meaning- Nature and Scope of Research - Values of Research in History-Pre-requisite of a Researcher.

Unit-II

Research Methodology- Selection of Topic- Hypothesis- Collection of data – Sources-Classification of Sources.

Unit-III

Historical Criticism- (Heuristics) External Criticism-(Hermenestics) Internal Criticism-Positive Interpretative Criticism and Negative Interpretative Criticism.

Unit-IV

Objectivity and Subjectivity in Historical Writing- Synthesis and Interpretation- Exposition.

Unit-V

Footnotes - Importance, Purpose, Uses and Abuses of Footnotes – Bibliography – Apendix - Index.

Books for Reference:

1.Anderson,Durston and Poole: Thesis and Assignment Writing. Wiley Eastern Limited, New Delhi, 1970.

2.Barzun,J and Graff, Henry : The Modern Researcher, University Press New York, 1980.

3.Carr.E.H. : What is History, Penguin Books, London 1982.

4.Subramanian,N : Histography and Historical Method.Udumalpet.1993.

China and First World War - Twenty One Demands - War Lords- May Fourth Movement - Rise of Chinese Communist Party

Unit-II

Achievement of Dr. Sun -Yat -Sen – Rise of Komintang - Achievement of Chiang -Kai -Shek- Manchurian Crises.

Unit-III

Second Sino - Japanese War, 1937 - Second World War-Civil War Between K.M. T. and C.C.P.

Unit-IV

Mao -Tse -Tung – Establishment of Peoples Republic of China - Cultural Revolution - Internal Reforms.

Unit-V

China and Contemporary World- Foreign Policy- Post Mao Period.

Books for Reference :

1.Shivakumar and Jain   : History of Modern China

2.N.Jayapalan   : History of China

3.Clyde and Bears   : Far East

4.F.M.Michel and G.S. Taylor   : The Far East And Modern World

M.PHIL. HISTORY

(FT/PT)

PART I

CORE PAPER I

RESEARCH METHODOLOGY AND THESIS WRITING

UNIT-I:

Meaning of Research - Types of Research - Science and its method - Social and its method - Social Science as science - New science and new social science.

UNIT-II:

Impact of Science on Historical Method - History as Social Science - Interdisciplinary approach to History.

UNIT-III:

Philosophy and Hermeneutics - Phenomenology - Historical Method - Objectivity - Subjectivity - Causation in History

UNIT-IV:

Combining Qualitative and Quantitative Method in Social Inquiry - De-construction as a Method of Research - From Hermeneutics to Post structuralism to Psychoanalysis - Feminism / Post structuralism - The Foundations of Experimental/Empirical Research Methods - The Positivist Paradigm in Contemporary Social Science Research - Introduction to Quantitative Methods.

UNIT-V:

Thesis writing: Choosing a Research topic - Data collection - Sources - Secondary & Primary - Internal and External criticism. Analytical and Synthetic operations - Documentation - Footnotes - Bibliography - Tables and Charts - Writing.

REFERENCES:

1. Bridget Somekh and Cathy Lewin, *Research Methods in the Social Sciences*, (New Delhi: Vistaar Publications, 2005).
2. Floud, Roderick.(1983) *An Introduction to Quantitative Methods for Historians*, London: Methuen (R.P).
3. Malcolm Williams, *Science and Social Science: An Introduction*, (London and New York: Routledge, 2000).
4. Martin Hollis, *The Philosophy of Social Science: An Introduction*, (New Delhi: Cambridge University Press, 2000).
5. *M.L.A. Hand Book for Researchers Thesis & Assignment Writing* (1990) New Delhi: Wily Eastern.
6. Topolski, Jerzy (1976) *Methodology of History*, Holland: Reidal Publishing Co.
7. Watson, George (1987) *Writing a thesis: A Guide to Long Essays and Dissertations*, Longman, London.

THEMES AND PERSPECTIVES ON THE NATURAL HISTORY

HISTORIOGRAPHY

UNIT-I

The Idea of History - Enlarging Scope of History - Definition of History and Historiography - History: Nature, Scope and Value - Social necessity of History - Philosophy of History.

UNIT-II

Evolution of the discipline of History: Greco-Roman History - Church Historiography - Medieval Arab Historiography: Ibn Khaldun - Enlightenment Historiography.

UNIT-III

French Historiography: Annales and Mentalities - British Marxist Historians - Evolution of Quantitative History in France and U.S.A. (Cliometrics) - Prosopography - Impact of Modernism (Namier) - Structuralism (Claude Levi Straus) and Postmodernism (Michel Foucault, Jacques Derrida).

UNIT-IV

Ancient Indian Historiographers: Bana, Kalhana - Mediaeval Indian Hisoriography: Alberuni, Barani - Western Indologists: James Mill, A.L. Basham - Vincent Arthur Smith - Indian Historians: K.P. Jayaswal, R.C. Dutt, J.N. Sarkar, D.D. Kosambi, R.S. Sharma.

UNIT-V

South Indian Historians: K.A. Nilakanta Sastri, K.K. Pillai

REFERENCES

E.H. Carr, What is History?, (Harmondsworth 1977)

R.G. Jones, "History the Poverty of Empiricism", in Robin Blackburn ed., Ideology in Social Science (Fontana, 1972)

R.G. Collingwood, The idea of History (Oxford 1977), Parts III, IV, V.

E.J. Hobsbawn, Karl Marx's Contribution to Historiography in Ideology and Social Science (Suffolk 1972)

Harvey Kay, The British Marxist Historians (Polity)

Stein, Burton, History of India, Oxford: Basil Blackwell, 1998

Champakalakshmi, R. Trade, Jdeology and Urbanization: South India 300 B.C to A.D 1300, New Delhi: Oxford University Press, 1996.

Romila Thapar, From Lineage to State: Social Formations in the Mid-First Millenium B.C New Delhi: Oxford University Press, 1984.

Sharma, Ram Sharan, Indian Feudalism, Madras: Macmillian India Ltd, 1965

"Theories of Nationalism and Cambridge Historiography" National Seminar on Historiography of Tamil Nadu jointly sponsored by the Department of Indian History, University of Madras and I.C.H.R southern region, Banglore, 28 & 29 March, 2001.

S. Clark, 'The Annales Historians', in Q. Skinner, (ed.), The Return of Grand Theory in the Human Sciences, (Cambridge 1985).

Journal of Modern History, 1972, Special No. on Annales.

Manickam S. (1977) Theory of History & Method of Research, Paduman Pub., Madurai Maurice Aymard and Harbans Mukhia, (eds.), French Studies in History, (New Delhi, 1988).

Marc Bloch, The Historian's Craft, (New York 1953).

Le Roy Ladurie, "The Event and the 'Long Term' on Social History" in the Territory of the Historian.

Ali, Sheik, (1980) History: Its Theory and Methods, New Delhi: MacMillan.

Floud, Roderick.(1983) An Introduction to Quantitative Methods for Historians, London: Methuen(R.P).

Guha, Ranajit (1994) Subaltern Studies Vol.I, IV and VI, Delhi: OUP.

Marwick, Aurther, (1984), The Nature of History, Hong Kong: Macmillan (Reprint),

M.L.A. Hand Book for Researchers Thesis & Assignment Writing (1990) New Delhi: Wily Eastern.

Stern, Fritz, (1973) Varities of History, New York: Vintage Books.

Stone, Lawrence, (1983) The Past and the Present, Boston: Routledge & Kegan Paul.

Topolski, Jerzy (1976) Methodology of History, Holland: Reidal Publishing Co.

Watson, George (1987) Writing a thesis: A Guide to Long Essays and Dissertations, Longman, London.

HISTORY OF TAMIL NADU A.D. 1900 – 1977

UNIT –I   Theosophical Society – Home Rule Movement – Justice Party.

Unit – II   Trade Union Movement – E.V.R – Self Respect Movement.

Unit – III   Congress (1937 – 1967) – Sathyamoorthy – Kamaraj – Rajaji.

Unit – IV   Emergence of DMK – C.N. Annadurai – M. Karunanithi – Socio – Economic Development.

Unit – V   Tamilnadu in Freedom Struggle – Education in Tamilnadu – Film and Politics.

References :

1) V.T. Chellam   :   Thamizhaga Varalarum Panpadum.

2) K.K. Pillai   :   A Social History of the Tamils.

3) P.Rajaraman   :   The Justice Party.

4) P.Subramanian   :   Social History of Tamils.

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2

DEPARTMENT OF ECONOMICS
UG-DEGREE COURSES SYLLABUS
B.A (ECONOMICS)

CBCS – PATTERN (With effect from 2017-18)

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
DEPARTMENT OF ECONOMICS
UG-DEGREE COURSES
B.A (ECONOMICS)
CBCS – PATTERN (With effect from 2017-18)

YEAR/SEMESTER	PART	SUBJECT	PAPER CODE	TITLE OF THE PAPER	HOURS WEEKLY	CREDIT	Exam/Hrs	IA	EA	Total
								Max Marks		
IYEAR/SEMESTER -I	I	Tamil	17U1FTI	Tamil - I	6	3	3	25	75	100
	II	English	17U1FEI	English - I	6	3	3	25	75	100
	III	Core - I	17U1EC1	Micro Economics - I	5	4	3	25	75	100
	III	Core -II	17U1EC2	Elementary Statistics for Economics - I	5	4	3	25	75	100
	III	Allied - I	17UIAEC1	Rural Economy	6	5	3	25	75	100
	IV	Compulsory	17UIENV	Environmental Studies	2	2	3	25	75	100
				TOTAL	**30**	**21**				**600**
IYEAR/SEMESTER - II	I	Tamil	17U2EC3	Tamil - II	6	3	3	25	75	100
	II	English	17U1FE2	English - II	6	3	3	25	75	100
	III	Core -III	17U2EC3	Micro Economics - II	5	5	3	25	75	100
	III	Core - IV	17U2EC4	Elementary Statistics for Economics - II	5	4	3	25	75	100
	III	Allied - II	17U2AEC2	Principles of Marketing	6	4	3	25	75	100
	V		17U2VE	Value Education(General Awareness)	2	2	3	25	75	100
				TOTAL	**30**	**21**				**600**
II YEAR /SEMESTER -III	I	Tamil	17U3FT3	Tamil - III	6	3	3	25	75	100
	II	English	17U1FE3	English - III	6	3	3	25	75	100
	III	Core - V	17U3EC5	Indian Economic Development problems and policies - I	4	4	3	25	75	100
	III	Core - VI	17U3EC6	Monetary Economics - I	4	4	3	25	75	100
	III	Allied -III	17U3AEC3	Mathematics for Economics	5	5	3	25	75	100
	IV	SB - I	17U3ECSB	Entrepreneurial Development	3	3	3	25	75	100
	NM	Elective - 1	17U3ECNM	General Economics - I	2	2	3	25	75	100
				TOTAL	**30**	**21**				**700**

YEAR/SEMESTER	PART	SUBJECT	PAPER CODE	TITLE OF THE PAPER	HOURS WEEKLY	CREDIT	Exam/Hrs	Max Marks		
								IA	EA	Total
II YEAR /SEMESTER -IV	I	Tamil	17U3FT3	Tamil - III	6	3	3	25	75	100
	II	English	17U1FE4	English - IV	6	3	3	25	75	100
	III	Core - VII	17U4EC7	Indian Economic Development problems and policies - II	4	4	3	25	75	100
	III	Core - VIII	17U4EC8	Monetary Economics - II	4	5	3	25	75	100
	III	Allied -IV	17UAEC4	Industrial Economics	5	4	3	25	75	100
	III	SB - II	17U4ECSB	Economics of Insurance	3	3	3	25	75	100
	III	NM(Non Major)	17U4ECNM	General Economics - II	2	2	3	25	75	100
				TOTAL	30	24				700
III YEAR /SEMESTER -V	III	Core –IX	1U5EC9	Macro Economics - I	6	4	3	25	75	100
	III	Core –X	172U5EC10	Fiscal Economics - I	6	4	3	25	75	100
	III	Core -XI	17U5EC11	Environmental Economics	5	4	3	25	75	100
	III	Elective –I	17U5ECE1	Health Economics	5	4	3	25	75	100
	III	ElectiveII	17U5ECE2	Managerial Economics	5	4	3	25	75	100
	IV	SB - III	17U5ECSB	Human Resource Development	3	3	3	25	75	100
				TOTAL	30	23				600
III YEAR /SEMESTER -VI	III	Core –XII	17U6EC12	Macro Economics - II	6	5	3	25	75	100
	III	Core -XIII	17U6EC13	Fiscal Economics - II	6	5	3	25	75	100
	III	Core -XIV	17U6EC14	Economic Development of Tamilnadu	5	5	3	25	75	100
	III	Core -XV	17U6EC15	Economic Thought	5	5	3	25	75	100
	III	Elective-III	17U6ECE3	Labour Economics	5	4	3	25	75	100
	SB-IV	SB-IV	17U6ECSB	Economics of Social Issues	3	3	3	25	75	100
	V	EA	17U6ECEA	Extension Activity		1			50	50
				TOTAL	30	28				650
				GRAND TOTAL	180	141				3850

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
DEPARTMENT OF ECONOMICS
UG-DEGREE COURSES
B.A (ECONOMICS)
CBCS – PATTERN (With effect from 2017-18)

SEMESTER -I

I year/Semester	Part	Subject	Paper Code	Title of the Paper	Hours Weekly	Credit	Exam/Hrs	Max Marks		
								IA	EA	Total
Semester -I	III	Core – I	17U1EC1	Micro Economics – I	5	4	3	25	75	100
	III	Core –II	17U1EC2	Elementary Statistics for Economics - I	5	4	3	25	75	100
	III	Allied - I	17UIAEC1	Rural Economy	6	5	3	25	75	100
	IV	Compulsory	17UIENV	Environmental Studies	2	2	3	25	75	100

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
DEPARTMENT OF ECONOMICS
UG-DEGREE COURSES
B.A (ECONOMICS)
CBCS – PATTERN (With effect from 2017-18)

SEMESTER –II

I year /Semester	Part	Subject	Paper Code	Title Of The Paper	Hours Weekly	Credit	Exam/Hrs	Max Marks		
								IA	EA	Total
Semester - II	II I	Core –III	17U2EC3	Micro Economics - II	5	5	3	25	75	100
	II I	Core – IV	17U2EC4	Elementary Statistics for Economics - II	5	4	3	25	75	100
	II I	Allied – II	17U2AEC2	Principles of Marketing	6	4	3	25	75	100
	V	VE	17U2VE	Value Education(General Awareness)	2	2	3	25	75	100

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
DEPARTMENT OF ECONOMICS
UG-DEGREE COURSES
B.A (ECONOMICS)
CBCS – PATTERN (With effect from 2017-18)

SEMESTER –III

Year/Semester	Part	Subject	Paper code	Title of the paper	Hours Weekly	Credit	Exam/hrs	Max Marks		
								IA	EA	Total
II Year /Semester -III	III	Core - V	17U3EC5	Indian Economic Development I	4	4	3	25	75	100
	III	Core - VI	17U3EC6	Monetary Economics - I	4	4	3	25	75	100
	III	Allied -III	17U3AEC3	Mathematics for Economics	5	5	3	25	75	100
	III	SB - I	17U3ECSB	Entrepreneurial Development	3	3	3	25	75	100
	III	NM(Non Major)	17U3ECNM	General Economics - I	2	2	3	25	75	100

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
DEPARTMENT OF ECONOMICS
UG-DEGREE COURSES
B.A (ECONOMICS)
CBCS – PATTERN (With effect from 2017-18)

SEMESTER –IV

Year/Semester	Part	Subject	Paper code	Title of the paper	Hours Weekly	Credit	Exam/hrs	IA	EA	Total
								Max Marks		
II Year /Semester -IV	III	Core - VII	17U4EC7	Indian Economic Development	4	4	3	25	75	100
	III	Core - VIII	17U4EC8	Monetary Economics - II	4	5	3	25	75	100
	III	Allied -IV	17UAEC4	Industrial Economics	5	4	3	25	75	100
	III	SB - II	17U4ECSB	Economics of Insurance	3	3	3	25	75	100
	III	NM(Non Major)	17U4ECNM	General Economics - II	2	2	3	25	75	100

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
DEPARTMENT OF ECONOMICS
UG-DEGREE COURSES
B.A (ECONOMICS)
CBCS – PATTERN (With effect from 2017-18)

SEMESTER –V

Year/Semester	Part	Subject	Paper code	Title Of the Paper	Hours Weekly	Credit	Exam/hrs	IA	EA	Total
								Max Marks		
III Year/Semester -V	III	Core –IX	17U5EC9	Macro Economics – I	6	4	3	25	75	100
	III	Core –X	17U5EC10	Fiscal Economics – I	6	4	3	25	75	100
	III	Core -XI	17U5EC11	Environmental Economics	5	4	3	25	75	100
	III	Elective -I	17U5ECE1	Health Economics	5	4	3	25	75	100
	III	Elective-II	17U5ECE2	Managerial Economics	5	4	3	25	75	100
	IV	SB - III	17U5ECSB	Human Resource Development	3	3	3	25	75	100

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
DEPARTMENT OF ECONOMICS
UG-DEGREE COURSES
B.A (ECONOMICS)
CBCS – PATTERN (With effect from 2017-18)

SEMESTER –VI

Year/Semester	Part	Subject	Paper Code	Title of the Paper	Hours/ weekly	Credit	Exam/hrs	IA	EA	Total
								Max Marks		
III Year/Semester -VI	III	Core –XII	17U6EC12	Macro Economics - II	6	5	3	25	75	100
	III	Core -XIII	17U6EC13	Fiscal Economics - II	6	5	3	25	75	100
	III	Core -XIV	17U6EC14	Economic Development of Tamilnadu	5	5	3	25	75	100
	III	Core -XV	17U6EC15	Economic Thought	5	5	3	25	75	100
	Elective-III	Elective-III	17U6ECE3	Labour Economics	5	4	3	25	75	100
	SB-IV	SB-IV	17U6ECSB	Economics of Social Issues	3	3	3	25	75	100
	V	EA	17U6ECEA	Extension Activity		1			50	50

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
B.A ECONOMICS (SEMESTER-I)
Core I: MICRO ECONOMICS-I
Subject Code: 17U1EC1
CBCS – PATTERN (With effect from 2017-18)

UNIT-I: Definition and Scope of Economics

Definition and Scope of Economics - Production Possibility Curve - Positive vs Normative Economics Analysis - Micro and Macro Analysis - Role of Price Mechanism - Demand and Supply - Market Equilibrium.

UNIT-II: Utility and Indifference Curve Analysis

Utility - Cardinal And Ordinal Approaches; Indifference Curve; Consumer's Equilibrium (Hicks Andslutsky); Giffin Goods; Compensated Demand; Elasticity of Demand - Price, Income And Cross;Consumer's Surplus; Engel Curve.

UNIT-III: Demand Theory

Theory of Demand - Elasticity of Demand and Supply - Measurement of Elasticity - Concept of Consumer's Surplus - Hicks Treatment of Consumers Surplus.

UNIT-IV: Production Function

Production Function - Law of Variable Proportions - Laws of Return to Scale - Cobb–Douglas Production Function.

UNIT-V: Cost Concept

Total and Marginal Costs - Revenue Curves - Short-run And Long-run Cost Curves - Fixed and Variables Costs - Equilibrium of the Firm.

BOOKS FOR REFERENCE

1. Stonier & Hague; Text book of Economic Theory
2. Mc Connel & Gupta, Economics
3. R.Leftwitch, Price System and Resource Allocation
4. Watson, Price Theory and its Uses
5. P.A Samuelson, Economics
6. Bell and Todaro, Economic Theory
7. Richard A. Bilas, Micro Economic Theory
8. Dominick and Salvators , Micro Economics
9. Joan Robinson and Eatwell, Introduction to Positive economics
10. Richard G. Lispey, An introduction to positive economics

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
B.A ECONOMICS (SEMESTER-I)
Core II: ELEMENTARY STATISTICS FOR ECONOMICS – I
Subject Code: 17UIEC2
CBCS – PATTERN (With effect from 2017-18)

UNIT-I: STATISTICS

Meaning - Definition - Relationship with other Subjects - Functions - Objectives - Importance and Limitations - Classification - Tabulation - Frequency Distribution - Diagrams - Graphical presentation.

UNIT-II: COLLECTION OF DATA

Primary and Secondary Data - Methods of Collecting Primary Data - Sources of Secondary Data - Questionnaire - Census and Sampling Method.

UNIT-III: MEASURES OF CENTRAL TENDENCY

Introduction - Objectives of Average - Types of Average: Mean, Median, Mode - Geometric Mean - Harmonic Mean.

UNIT-IV: MEASURES OF DISPERSION

Meaning - Objectives - Types: Range - Quartile Deviation - Mean Deviation - Standard Deviation and Co-efficient of Variation - Lorenz Curve.

UNIT-V: SKEWNESS AND KURTOSIS:

Skewness: Meaning - Methods - Karlspearsons Co-efficient of Skewness - Bowley's Co-efficient of Skewness. **Kurtosis:** Meaning - Types - Measurement of Kurtosis.

BOOKS FOR REFERENCE

1. SP Gupta – Statistical Methods

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
B.A ECONOMICS (SEMESTER-I)
Allied I: RURAL ECONOMY
Subject Code: 17U1AEC1
CBCS – PATTERN (With effect from 2017-18)

UNIT-I: RURAL ECONOMY

Nature and Scope of Rural Economy - Importance of Agriculture in Economic Development of India - Rural Economic problems of India - Nature of land Problems -Evolution of Policy - Land Reforms.

UNIT-II: AGRICULTURAL HOLDINGS

Agricultural Holdings - Fragmentation and Sub-division of Holdings - cooperative Farming - Rural Labour Problems - Nature of Rural Unemployment - Employment and Wage Policy - Sources of Technological change and Green Revolution.

UNIT-III: RURAL SOCIETY

Rural Society - Its Structure and Change - Village and its Social Organization - Indian Village and its types - Rural-Urban Continum and Rural-Urban Relationships.

UNIT-IV: RURAL SOCIAL INSTITUTIONS

Rural social Institutions - Family, Property, Caste, Class, Agarian Structure, Indebtedness and Poverty - Religion - Village - Local Self Government - Panchayat Raj and Community Development Prgrommes.

UNIT-V: SOCIAL CHANGES

Social Change in Rural India - Impact of Westernization - Secularization - Modernization of Indian Rural Society - Post Modernization - Globalization and Indian Villages.

BOOKS FOR REFERENCE

1. Carver, The Principles of Rural Economics.
2. Desai, A., Rural Sociology in India.
3. Dube, S.C., India's changing villages.
4. Nanavati & Anjala, rural problems in India.
5. Ruddar Dutt & K.P.M.Sundaram, Indian Economy.
6. Sachdeva, D.A.& Vidya Bhushan, An Introduction to Sociology.

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
B.A ECONOMICS (SEMESTER-I)
ENVIRONMENTAL STUDIES
Subject Code: 17U1EVS
CBCS – PATTERN (With effect from 2017-18)

UNIT-I: INTRODUCTION   TO   ENVIRONMENTAL   SCIENCES: NATURAL RESOURCES

Resources - Water Resources - Mineral Resources - Food Resources - Conflicts over Resource Sharing - Exploitation - Land Use Pattern - Environmental Impact - Fertilizer - Pesticides Problems - Case Studies.

UNIT-II: ECOSYSTEM, BIODIVERSITY AND ITS CONSERVATION

Ecosystem: Concept - Structure and Function - Procedures, Consumers and Decomposers - Food Chain - Food Web - Ecological Pyramids - Energy Flow - Forest, Grassland, Desert and Aquatic Ecosystem.

Biodiversity: Definition - Genetic, Species and Ecosystem Diversity - Values and Uses of Biodiversity - Biodiversity at Global, National (India) and Local Levels - Hotspots, Threats to Biodiversity - Conservation of Biodiversity - Insitu & Exsitu.

UNIT-III: ENVIRONMENTAL POLLUTION AND MANAGEMENT

Environmental Pollution - Causes - Effect and Control Measures of Air, Water, Marine, Soil, Solid Waste, Thermal, Nuclear Pollution And Disaster Management - Floods, Earth Quake, Cyclone And Landslides - Role of Individuals in Prevention of Pollution - Pollution Case Studies.

UNIT-IV: SOCIAL ISSUES – HUMAN POPULATION

Urban Issues - Energy - Water Conservation - Environmental Ethics - Global Warming - Resettlement and Rehabilitation Issues - Environmental Legislations - Environmental Production Act 1986 - Air, Water, Wildlife and Forest Conservation Act - Population Growth and Explosion - Human Right and Value Education - Environmental Health - HIV/AIDS - Role of IT in Environment and Human Health - Women and Child Welfare - Public Awareness - Case Studies.

UNIT-V: FIELD WORK

Visit to Local Area / Local Polluted Site / Local Simple Ecosystem - Report Submission.

BOOKS FOR REFERENCE

Kumarasamy, K., A.Alagappa Moses and, M.Vasanthy Environmental Studies, Bharathidasan University, Trichy.
Rajamannar, Environmental Studies, EVR College, Trichy.
Kalavathy,S., Environmental Studies, Bishop Heber College, Trichy.

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2

UNIT-I: Market Structure - I

Market Structure - Importance of Time Element in Price Theory - Pricing under Perfect Competition - Assumption – Short-run and Long-run Equilibrium of the firm- Monopoly: Meaning - Types of Monopoly – Short-run and Long-run Equilibrium of the Firm - Price discrimination - Comparison between Monopoly and Perfect Competition.

UNIT-II: Market Structure - II

Monopolistic Competition: Meaning and Its Assumption – Short-run and Long-run Equilibrium - Price Discrimination: Excess Capacity - Selling Cost - Oligopoly: Oligopoly Characteristics of Oligopoly - Kinked Demand Curve - Duopoly Models: Curnot Model - Edge Worth Model - Chamberlin Model.

UNIT-III: Theory of Distribution

Theory of distribution - Marginal Productivity Theory of Distribution - Rent - Ricardian Theory of Rent - Quasi rent - Modern Theory of Rent.

UNIT-IV: Theory of Wages

Wages - Theories of Wages - Real and Money Wages - Collective Bargaining - Trade Union and Wages - Interest - Gross   and Net Interest - Classical Theory of Interest - Liquidity Preference Theory of Interest.

UNIT-V: Theories of Profit

Profit - Theories of Profit - Income Inequality - Causes and Remedial Measures.

BOOKS FOR REFERENCE

1. Stonier & Hague, Text book of Economic Theory
2. Mc Connel & Gupta, Economics
3. R.Leftwitch, Price System and Resource Allocation
4. Watson, Price Theory and its Uses
5. P.A Samuelson , Economics
6. Bell and Todaro , Economic Theory
7. Richard A. Bilas, Micro Economic Theory
8. Dominick and Salvators, Micro Economics
9. Joan Robinson and Eatwell, Introduction to Positive economics
10. Richard G. Lispey , An introduction to positive economics

UNIT-I: CORRELATION

Meaning - Types - Methods: Scatter Diagram - Graph - Karlspearson's Co-efficient of Correlation - Spearman's Rank Correlation - Concurrent Deviation.

UNIT-II: REGRESSION

Meaning - Difference between Correlation and Regression - Regression Equations.

UNIT-III: TIME SERIES

Meaning - Uses - Components of Time Series: Long-term Trend - Seasonal Variations - Cyclical Variations - Irregular Variations.

UNIT-IV: INDEX NUMBERS

Meaning - Uses : Range - Problems in the Construction of Index Numbers - Methods : Unweighted Index Numbers - Weighted Index Numbers : Laspyre's - Paschv's - Fisher's - Cost of Living Index Numbers - Limitations.

UNIT-V: PROBABILITY

Meaning - Definition - Theorems of Probability: Addition Theorem - Multiplication Theorem.

BOOKS FOR REFERENCE

1. Statistical Methods – S.P.Gupta
2. Statistical Methods - R.D.Gupta

UNIT-I: INTRODUCTION

Meaning of Markets - Marketing and Marketing Management - Marketing and Consumer Environment - Marketing Mix - Understanding the Consumer - Consumer Markets and Business Markets.

UNIT-II: PRODUCT

Meaning - Product - New product Development - Product Mix and Product Life Cycle Strategy - Product Levels and Product Lines - Branding, Packaging and Labeling - Marketing Segmentation - Targeting and Positioning.

UNIT-III: PRICING AND PLACE

Meaning of Pricing - Factors to Consider for Pricing - Internal and External, Including Pricing Objectives - Methods of Pricing - Adopting the Price - Marketing Channels and its nature - Functions and Types - Channel Design Management - Channel Behavior, Organisation and Conflict.

UNIT-IV: PROMOTION

Meaning - Communication Process - Setting the Communication Objectives - Steps in Developing Effective Communication - Setting the total Promotion Budget - Setting the Promotion Mix.

UNIT-V: CHANNELS OF DISTRIBUTION

Meaning - Marketing Channels and its Nature - Functions and Types - Channel Design Management - Channel Behavior, Organization and Conflict.

BOOKS FOR REFERENCE

1. Philip Kotler, Gary Armstrong, Prafulla Y. Agnihotri, Ehsan ul Haque, Principles of Marketing.
2. Dr. R L Varshney & Dr. S L Gupta, Marketing Management - An Indian Perspective.
3. William J Stanton, Michael J Etzel, Bruce J Walker, Fundamentals of Marketing, Mc GrawHill.

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
B.A ECONOMICS (SEMESTER-II)
VALUE EDUCATION
Subject Code: 17U2VE

UNIT-I

Value Education - Definition - Relevance to Present Day - Concept of Human Values - Self Introspection - Self Esteem.

UNIT-II

Family Values - Components, Structure and Responsibilities of Family - Naturalisation of Anger - Adjustability - Threats of Family Life - Status of Women in Family and Society - Caring for Needy and Elderly - Time Allotment for Sharing Ideas and Concerns.

UNIT-III

Ethical Values - Professional Ethics - Mass Media Ethics - Advertising Ethics - Influence of Ethics on Family Life - Psychology of Children and Youth - Leadership Qualities - Personality Development.

UNIT-IV

Social Values - Faith, Service and Secularism - Social Sense and Commitment - Students and Politics - Social Awareness, Consumer Awareness, Consumer Rights and Responsibilities - Redressal Mechanisms.

UNIT-V

Effect of International Affairs on Values of Life. Issue of Globalization - Modern Warfare - Terrorism, Environmental Issues - Mutual Respect of Different Cultures, Religions and their Beliefs.

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS) ,VELLORE-2
B.A ECONOMICS (SEMESTER-III)
Core V: INDIAN ECONOMIC DEVELOPMENT PROBLEMS AND POLICIES-I
Subject Code: 17U3EC5

UNIT-I: ECONOMCI DEVELOPMENT & GROWTH

Meaning of Economic Development and Growth - Features of the Indian Economy as Developing Economy - Major Issues of Economic Development - Economic and Non-Economic Factors Determinant of Economic Development.

UNIT-II: DEMOGRAPHIC CHARACTERISTICS

Size and Growth Rate of Population - Sex - Ratio - Density - Demographic Transition Theory - Demography Dividend - New Population Policy 2000 - Human Development Index.

UNIT-III: INDIAN AGRICULTURE

Role of Agriculture in the Indian Economy - Growth of Agriculture Production and Productivity - Problems of Productivity in Indian Agriculture - Green Revolution - Cropping Pattern - Agricultural Inputs - Land Reforms.

UNIT-III: INDIAN INDUSTRIES

Role of Industry in the Indian Economy - Pattern of Industrialization: Large Scale Industry: Iron and Steel Industries - Cotton Industries - Sugar Industries - Chemical Industries - Role of Cottage- Small Scale - Micro Small and Medium (MSM) Industries in Indian Industries - Industrialization Policy of 1956,1977,1980 and 1991.

UNIT-IV: TERTIARY SECTOR IN INDIA ECONOMY

Growth of Service Sectors in India - Economic Infrastructure; Power - Energy - Growth of Transport Systems - Balance of Trade and Balance of Payments in India.

UNIT-V: ECONOMIC PLANNING, NITI AAYOG AND ECONOMIC DEVELOPMENT IN INDIA

Economic Planning in India - Objectives - Strategy - Different Five Year Plan in India - Planning Experience in India; Achievement and Failures - Function of NITI Aayog.

BOOKS FOR REFERENCE

1. Datt & Sundaram: Indian Economy
2. Misra and Purai: Indian Economy
3. Uma Kapila: Indian Economy: Performance and Policies
4. Economic Survey

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
B.A ECONOMICS (SEMESTER-III)
Core VI: MONETARY ECONOMICS - I

UNIT-I: NATURE AND FUNCTIONS OF MONEY

Evolution - Meaning - Definition and Functions of Money - Kinds of Money - Significance of Money - Characteristics of Good Money.

UNIT-II: SUPPLY AND DEMAND FOR MONEY

Definition - Determinants of Money Supply - Meaning of Demand for Money - Keynesian and Post Keynesian Approach Demand for Money.

UNIT-III: VALUE OF MONEY

Concept - Difficulties in Measuring the Changes in the Value of Money - Fisher's Quantity Theory of Money - Cambridge Equations Theory of Money (cash balance approach) - Transactions Approach Vs Cash Balance Approach.

UNIT-IV: MONEY AND PRICES

Keynesian Reformulated Quantity Theory of Money - Friedman's Quantity Theory of Money - Real Balance Effect.

UNIT-V: THEORY OF INCOME DETERMINATION, INFLATION AND DEFLATION

Keynesian Theory of Employment - Keyne's Psychological Law of Consumption - Meaning of Inflation and Deflation - Mechanisms of Inflation (Demand-pull, Cost-push, Wage-push, Profit-push, Mark-up Inflation).

BOOKS FOR REFERENCE

1.Sethi.T.T., Monetary Economics, S.Chand & Company Ltd, New Delhi.

2.Jhingan.M.L, Macro Economic Theory, Vrinda Publication (p) Ltd, Delhi.

3.Sundaram.K.P.M., Money, Banking, Trade and Finance, Sultan chand & sons, New Delhi.

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
B.A ECONOMICS (SEMESTER-III)
Allied-III: MATHEMATICS FOR ECONOMICS

UNIT-I: NUMBERS AND VARIABLES

Introduction - Numbers of Various Types - Real Number System - Continuous and Discontinuous Variables - Quantities and their Measurement.

UNIT-II: FUNCTIONS

Definition and examples of functions - Graphs of Functions - Functions and Curves - Classification of Functions - Functions types.

UNIT-III: ELEMENTARY ANALYTICAL GEOMETRY

Introduction - Gradient of a Straight Line - Equation of a Straight Line - Parabola - Rectangular Hyperbola.

UNIT-IV: LIMITS

Fundamental Notion of a Limit - Examples of the Limit of a Function - Definition of the Limit - Limiting and Approximate Values - Properties of Limits.

UNIT-V: FUNCTIONS AND DIAGRAMS

Introduction - Demand Function and Curves - Particular Demand Functions and Curves - Total Revenue Functions and Curves - Cost functions and Curves.

BOOKS FOR REFERENCE

1. R.G.D. Allen - Mathematical analysis for Economists.

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
B.A ECONOMICS (SEMESTER-III)
Skill Base: ENTREPRENEURIAL DEVELOPMENT

UNIT-I: INTRODUCTION

Introduction - Meaning - Importance - Evolution of term Entrepreneurship - Factors influencing Entrepreneurship - Characteristics of an Entrepreneur - Types of Entrepreneur - Barriers to Entrepreneurship.

UNIT-II: MOTIVATION

Entrepreneurial Motivation - Maslow's Theory - Herjburg's Theory - McGragor's Theory - Achievement Theory - Culture & Society - Values / Ethics - Risk Taking Behavior.

UNIT-III: CREATIVITY

Creativity and Entrepreneurship - Steps in Creativity - Innovation and Inventions - Using left Brain Skills to Harvest Right Brain Ideas - Legal Protection of Innovation - Skills of an Entrepreneur - Decision Making and Problem Solving .

UNIT-IV: ORGANISATION ASSISTANCE

Organisation Assistance - Assistance to an Entrepreneur - New Ventures - Industrial Park - Special Economic Zone - Financial Assistance by Different Agencies - MSMED Act - Carry on Business (COB) License - Environmental Clearance - National Small Industries Corporation (NSIC).

UNIT-V: RULES AND LEGISLATION

Rules and Legislation - Applicability of Legislation - Industries Development (Regulations) Act, 1951 - Factories Act, 1948 - The Industrial Employment (Standing Orders) Act, 1946 - Suspension - Stoppage of work - Termination of Employment - Environment (Protection) Act, 1986 - The sale of Goods Act, 1950 - Industrial Dispute Act 1947.

BOOKS FOR REFERENCE

1. Tendon ,C: Environment and Entrepreneur; Cliugh Publications, Allahabad.
2. Siner A David: Entrepreneural Megabuks; John Wiley and Sons, New York.
3. Srivastava S. B: A Practical Guide to Industrial Entrepreneurs; Sultan Chand and Sons, New Delhi
4. Prasanna Chandra: Protect Preparation, Appraisal, Implementation; Tata McGraw Hill. New Delhi
5. Paudey I.M: Venture Capital - The Indian Experience; Prentice Hall of India. New Delhi
6. Holt: Entrepreneurship-New Venture Creation; Prentice Hall of India. New Delhi

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
B.A ECONOMICS (SEMESTER-III)
Non Major: GENERAL ECONOMICS-I
Subject Code: 17U3ECNM

UNIT-I: ECONOMIC GROWTH AND ECONOMIC DEVELOPMENT

Meaning of Economic Growth - Meaning of Economic Development - Definition - Nature - Determinants of Economic Development and Economic Growth - Obstacles.

UNIT-II: NATIONAL INCOME

Meaning - Basic Concepts - Methods of Calculation - Recent Trends - Importance - Problems of Calculation - Per-capita income.

UNIT-III: POPULATION AND POVERTY

Population Growth in India - Causes and Controlling of Population - Sex Ratio and Literacy Level - Density - Population Policy - Poverty in India - Poverty Eradication Programmes - Causes of Poverty - Absolute and Relative Poverty.

UNIT-IV: AGRICULTURE

Production - Productivity - Contribution of Agricultural Sector in Indian Economy - Reforms - Causes of Low Productivity - Green Revolution.

UNIT-V: PLANNING COMMISSION

Planning - Meaning - Objectives of Planning - Types of Planning - India's Five Year Plan - Sources of Five Year Plan - NITI Aayog.

BOOKS FOR REFERENCE

1. Edward Shapiro, Macro Economics
2. Breoman F., Macro Economics
3. Dutt, Rudder and Sundharam KPM., Indian Economy
4. Dr. Radha., Indian Economy

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
B.A ECONOMICS (SEMESTER-IV)
Core VII: INDIAN ECONOMIC DEVELOPMENT PROBLEMS AND POLICIES-II
Subject Code: 17U4EC7

UNIT-I: UNEMPLOYMENT PROBLEMS IN INDIA

Employment and Unemployment Condition in India - Nature, Estimates and Causes of Unemployment - Various Unemployment Programmes in India.

UNIT-II: POVERTY AND INEQUALITY IN INDIA

Measurement of Poverty and Inequality - Nature, Estimates and Causes of Poverty in India - Various Poverty Alleviation Programmes in India.

UNIT-II: FOOD SECURITY IN INDIA

Concept of Food Security - Food Production in India - Public Distribution Systems in India - Agricultural Price Policy - Function of Food Corporation in India.

UNIT-IV: ECONOMIC REFORMS IN INDIA

Background of Economic Reforms - Structural Adjustment Policy - Liberalisation - Privatization - Globalization - LPGs and Its Impact on Indian Economy.

UNIT-V: FINANCE AND TRADE REFORMS

Financial Sectors Reforms - Foreign Direct Investment (FDI) - Special Economic Zones - India and WTO in Global Economy.

BOOKS FOR REFERENCE

1. Datt & Sundaram: Indian Economy
2. Misra and Purai: Indian Economy
3. Uma Kapila: Indian Economy: Performance and Policies
4. Economic Survey

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
B.A ECONOMICS (SEMESTER-IV)
Core VIII: MONETARY ECONOMICS - II
Subject Code: 17U4EC8

UNIT-I: MONETARY POLICY

Meaning - Nature - Objectives of Monetary Policy - Instrument of Monetary Policy - Role of Monetary Policy in Developing Economies - Monetary Policy in India.

UNIT-II: COMMERCIAL BANKING

Evolution - Meaning - Definition of Banking - Functions of Commercial Bank - Role of Commercial Banks in a Developing Economy - Credit Creation - Credit Control - Determination of Credit Control.

UNIT-III: CENTRAL BANKING

Meaning - Characteristics - Nature of Central Bank - Organization and Management of RBI - Functions of RBI.

UNIT-IV: MONEY MARKET

Meaning - Definition - Composition of Money Market - Characteristics - Importance - Structure of the Indian Money Market.

UNIT-V: INTERNATIONAL ASPECTS OF MONEY

Balance of Payments - Foreign Exchange Rates - Mint Par Theory - PPP Theory - IMF and SDR Scheme.

BOOKS FOR REFERENCE

1.Sethi.T.T Monetary Economics, S.Chand & Company Ltd, New Delhi.
2.Jhingan.M.L. Macro Economic Theory, Vrinda Publication (p) Ltd, Delhi.
3.Sundaram.K.P.M. Money, Banking, Trade and Finance, Sultan chand & sons, New Delhi.

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
B.A ECONOMICS (SEMESTER-IV)
Allied IV: INDUSTRIAL ECONOMICS
Subject Code: 17U4AEC4

UNIT-I: FRAMEWORK OF INDUSTRIAL ECONOMICS

Nature and Scope of Industrial Economics - Meaning of Industrialization - Role of Industry in Economic Development - Role of Public and Private Sectors.

UNIT-II: THEORIES OF INDUSTRIES

Theories of Industries: Hoffman, Chennery and Gershenkron - Theories of Industrial Location - Weber, Sargent Florence and Losch - Factors Affecting Location**.

UNIT-III: MARKET STRUCTURE

Concept and Organization of a Firm - Ownership Control and Objectives of a Firm - Market Structure: Seller's Concentration: Product Differentiation and Entry Conditions.

UNIT-IV: MARKET PERFORMANCE

Growth of a Firm - Size and Growth of a Firm - Growth and Profitability of a Firm - Constraints on Growth - Productivity, Efficiency and Capacity Utilization - Profitability and Innovation.

UNIT V: INDUSTRIAL FINANCE

Owned, External and Other Components of Funds - Financial Statement - Balance Sheets, Profit and Loss Account - Assessment of Financial Soundness.

BOOKS FOR REFERENCE

1. Ahluwalia I.J, *Industrial Growth in India*, Oxford University Press, New Delhi.
2. Barthwal R.R, *Industrial Economics*, Wiley Eastern Ltd, New Delhi.
3. Desai B, *Industrial Economics in India* (3rd Edition), Himalaya Publishing House.
4. Singh A and A N Sadhu*, Industrial Economics*, Himalaya publishing House**.

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
B.A ECONOMICS (SEMESTER-IV)
Skill Base: ECONOMICS OF INSURANCE
Subject Code: 17U4ECSB

UNIT-I: INTRODUCTION TO INSURANCE

Meaning - Definition - Nature - Functions - Classification of Insurance - Advantages of Insurance - Types of Insurance - Life Insurance - General Insurance - Fire Insurance - Marine Insurance - Miscellaneous Insurance.

UNIT-II: LIFE INSURANCE PRODUCTS AND CONTRACT

Life Insurance Products - Term Insurance, Whole Life, Endowment Annuities, Life Insurance Contract - Nature and Classification of Policies Selection of Risk Calculation of Premium Surrender Value - Claims.

UNIT-III: LIFE INSURANCE OF INDIA

Profile of Life Insurance Companies in India - Objectives - Functions of LIC - Economics Uses of Life Insurance - Life Insurance Products or Policies - Life Insurance various Plans.

UNIT-IV: INSURANCE IN ECONOMIC DEVELOPMENT AND MARKETING

Insurance and Mobilization of Savings - Insurance Institutions as Investment Institutions and their Role in Capital Market - Rural Insurance in India - Insurance Marketing - Selling Processes.

UNIT-V: INSURANCE LAWS AND REGULATIONS

Contract Act, Insurance Act, LIC Act, GIC Act, IRDA Act, Consumer Production Act - Risk Management.

BOOKS FOR REFERENCE

1. Black.K and Skipper.H.D, Life and Health Insurance, Prentice Hall, Upper Saddle River, New Jerssey.
2. Dionne.G and S.E. Harrington , Foundations of Insurance Economics, Kluwer Publishers, Buston.
3. Mishra M,N, Modern Concepts of Insurance, S.Chand & Co.
4. IRDA – "Insurance Development Authority – Regulation and Development".
5. Insurance Institutions of India – General Insurance.

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
B.A ECONOMICS (SEMESTER-IV)
Non Major: GENERAL ECONOMICS-II
Subject Code: 17U4ECNM

UNIT-I: INFLATION AND DEFLATION

Meaning - Types - Causes and Effects of Inflation - Controlling Measures - Inflationary Gap - Deflation - Effects of Deflation - Trade Cycle - Monetary Policy.

UNIT-II: PUBLIC FINANCE

Definition and Meaning - Difference Between Public Finance and Private Finance - Public Revenue - Public Expenditure - Causes of Increasing Public Expenditure in India - Taxes - Concept of Public Debt - Budget – Dr. Ambedkar Fiscal Policy.

UNIT-III: INTERNATIONAL TRADE

Difference Between Internal and External Trade - Balance of Payment(BOP) - Methods of Correcting Un-favorable BOP - Devaluation Recent Demonetrism in India - Functions of WTO, IMF, World Bank, BRICS.

UNIT-IV: FINANCIAL INSTITUTIONS

Internal Sources of Industrial Finance - External Sources of Finance - Industrial Development Bank of India (IDBI) - Industrial Finance Corporation of India (IFCI) - Industrial Credit And Investment Corporation of India (ICICI) - Industrial Re-construction Bank of India (IRBI) - State Financial Corporations (SFCS) - State Industrial Development Corporations (SIDCOS) - Unit Trust of India (UTI).

UNIT-V: RESERVE BANK OF INDIA

Functions of Reserve Bank of India - Organisation of Reserve Bank of India - Control of Credit - Relationship Between RBI and Commercial Banks.

BOOKS FOR REFERENCE

1. Tyagi, B.P., Public Finance
2. Sodernstein, B ., International Economics
3. Basu . S.K., Indian Banking
4. Dr. N. Premavathy., Banking Theory
5. Ellsworth P.T., International Economics
6. Dr. Balu, Foreign Trade

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
B.A ECONOMICS (SEMESTER-V)
Core IX: MACRO ECONOMICS - I
Subject Code: 17U5EC9

UNIT-I: THE NATURE AND SCOPE OF ECONOMICS

Introduction - Nature and Scope of Macro Economics - Limitations - Macro Statics - Macro Dynamics - Comparative Statics - Stock and Flow Concepts.

UNIT-II: NATIONAL INCOME

National Income - Concepts - Meaning - Measurement - Importance - Limitations - Circular Flow of Income and Expenditure - Social Accounting.

UNIT-III: THE CLASSICAL THEORY OF EMPLOYMENT

Introduction - Classical Theory of Employment – Keynes`s criticism of Classical Theory- Say`s Law of Markets - Meaning, Propositions and Implications of the Law - Criticism.

UNIT-IV: THE PRINCIPLES OF EFFECTIVE DEMAND

Effective Demand - Meaning - Aggregate Demand Price - Aggregate Supply Price - Determination of Effective Demand - Importance of Effective Demand - Keynesian Theory of Employment.

UNIT-V: CONSUMPTION FUNCTION

Meaning - Significance of MPC, Keynes` Psychological Law of Consumption Determinants of Consumption Function - Theories of Consumption Function the Absolute Income Hypothesis - The Relative Income Hypothesis - Permanent Income Hypothesis.

BOOKS FOR REFERENCE

1. Dhingra, I.C., Objective Type Questions in Macro Economics, Sultan Chand, New Delhi.
2. Dillard, Dudley, The Economics of John Maynard Keynes, Vikas Publishing Company, New Delhi.
3. Dwivedi, D.N., Macro Economics : Theory and Policy, Tata McGraw Hill Publishing Company Ltd., New Delhi.
4. Eugene A.Diulio, Macroeconomic Theory, Schaum's outline in Economics, McGraw Hill Book Company, New York.
5. Ghosh, B.N., and Rama Ghosh, Fundamentals of Monetary Economics, Himalaya Publishing Company, Bombay.
6. Harold R.Williams, Macroeconomics : Problems, Concepts and Self-tests, W.W. Norton & Company. Inc. New York.
7. Jhingan, M.L., Macro Economic Theory, Vani Educational Books (or) Konark Publisher Pvt. Ltd., New Delhi.
8. Mithani, D.M., Money, Banking, International Trade and Public Finance, Himalaya Publishing House, Bombay.

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
B.A ECONOMICS (SEMESTER-V)
Core X: FISCAL ECONOMICS -I
Subject Code: 17U5EC10
CBCS – PATTERN (With effect from 2017-18)

UNIT-I: SCOPE OF PUBLIC FINANCE

Meaning and Definition of Public Finance - Scope of Finance - Public Finance and Private Finance - The Principle of Maximum Social Advantage.

UNIT-II: PUBLIC REVENUE

Public Revenue - Classification of VAT Public Revenue - MODVAT - MANVAT - Tax And Non-tax Revenue - Canons of   Taxation - Types of Tax - Direct And Indirect Taxes - Effects of Taxations - Merits and Demerits of Direct and Indirect Taxes - GST.

UNIT-III: THEORIES OF TAXATION

Theories of Taxation - Factors Determining Taxable Capacity - Limits - Shifting and Incidence of Taxes - Distinction between Impact and Incidence - Factors Affecting Incidence of Taxation- Tax Evasion.

UNIT-IV: PUBLIC EXPENDITURE

Public Expenditure - Importance - Classification of Public Expenditure - Growth of Public Expenditure - Effects of Public Expenditure on Production, Employment and Distribution - Measures to Reduce Public Expenditure In India.

UNIT-V: PUBLIC DEBT

Public Debt - Meaning and Classification of Public Debt - Need for Public Borrowing - Effects of Public Debt - Burden of Public Debt - Growth of Public Debt In India - Control of Public Debt.

BOOKS FOR REFERENCE

1. Tyagi B.P "*Public Finance*," Jai Prakash Natu & Co, Meerut,7th Edition.
2. Singh S.K. "*Public Finance in Theory and Practices*," Sultan Chand & Co.
3. Srivastava D.K., "*Issues in Indian Public Finance*," New Century Publications.
4. Musgrave and Musgrave, *Public Finance Theory and Practicals*

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
B.A ECONOMICS (SEMESTER-V)
Core XI: ENVIRONMENTAL ECONOMICS
Subject Code: 17U5EC11
CBCS – PATTERN (With effect from 2017-18)

UNIT-1: INTRODUCTION OF ENVIRONMENT

Environmental Meaning and Definition - Service of Environment - Environmental and its Inter - Relationship with other Services - Economic and Environment - Nature and Scope of Environments.

UNIT-II: BASIC CONCEPTS

Public Goods - Characteristics of Public Goods - Environment as a Public Good - Externality and Market Failure - Pollution Externality and Economic Efficiency.

UNIT-III: NATURAL RESOURCES

Natural Resources - Land - Water - Atmosphere - Energy - Forest - Wild Life - Causes for Depletion of the Resources - Conservation of Resources - Meaning and Methods of Conservation.

UNIT-IV: ENVIRONMENTAL POLLUTION

Pollution - Meaning - Types of Pollution : Air - Water - Soil - Cares - Implication of Human Health - Animal and Vegetation - Green House Effect - Acid Rain - Measures of Control Pollution.

UNIT-V: LAW AND ENVIRONMENTAL PROTECTION

Environmental Protection - Environmental Policy (National & International) - Role of Official and Volunteers Agencies - National and State Control Board - Environmental Education.

BOOKS FOR REFERENCE

1) Sankaran. S., Environmental Economics
2) Karpagam. M., Environmental Economics
3) Varadarajan. S., Environmental Economics
4) Victor. P.A., Pollution, Economy and Environment
5) Dorfmen. R and Dorman. N.S., Economics of Environment.
6) Avanc. Vakil, Economics of Pollution
7) Saith Wick. C.H., Ecology and Quality of Environment

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
B.A ECONOMICS (SEMESTER-V)
Elective I: HEALTH ECONOMICS
Subject Code: 17U5ECE1
CBCS – PATTERN (With effect from 2017-18)

UNIT-I: HEALTH ECONOMICS

Definitions and Concepts - Evolution of Public Health - Important Public Health Acts -Health Problems of Developed and Developing Countries - Health Problems in India.

UNIT-II: ENVIRONMENTAL SANITATION

Environnmental Sanitation - Nutrition - Family Welfare and Planning - Reproductive and Child Health - Communicable and Non-communicable Disease.

UNIT-III: DETERMINANTS OF HEALTH

Determinants of health - Economic Dimensions of Health Care - The concept of human life Value - Benefit-cost and Cost Effectiveness Approaches - Inequalities in Health and Class and Gender Perspectives - Institutional Issues in Health Care Delivery.

UNIT-IV: EVOLUTION OF POPULATION GROWTH

Definition - Scope - Evolution of Population Growth - Problems of Population Growth - Birth Rates - Death Rates - Fertility Rates - Age Specific Mortality Rates - MMR(Measles Mumps and Rubella) - CPR(Cardio Pulmonary Resuscitation).

UNIT-V: ORGANISATION AGENCIES

Objectives - Organization of Important Agencies like, WHO - UNICEF - FAO - ILO - Indian Red Cross Society - World Bank - Asia Development Bank - Ford Foundation and their role in Health Care Activities.

BOOKS FOR REFERENCE

1. Health Economics, Jay Battacharya, Timothy Hyde, and Peter, 1st Edition, Palgrave Macmillan.
2. William, Jack, Principles of Health Economics for Developing Countries, World 24 Bank Institute Development Studies.
3. World Development Report, Investing in Health, The World Bank.
4. V. Ramankutty – A Premier of Health System Economics, Allied publications New Delhi
5. Kannan KP, Health Development in Rural Kerala – (KSSP, Thiruvanthapuram.)..
6. Henderson JW - Health Economics and Policy – Thomson learning.

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
B.A ECONOMICS (SEMESTER-V)
Elective II: MANAGERAL ECONOMICS
Subject Code: 17U5ECE2
CBCS – PATTERN (With effect from 2017-18)

UNIT-I: NATUREAND SCOPE OF MANAGERIAL ECONOMICS

Definition - Nature and Scope of Managerial Economics - Chief Characteristics of Managerial Economics - Role and Responsibilities of Managerial Economics and Business Decision Making - Some Fundamental Concepts of Managerial Economics.

UNIT-II: DEMAND FORECASTING AND METHODS

Demand Forecasting - Types of Demand Forecasting - Factors involves in Demand Forecasting Purpose of Forecasting - Determinations of Demand- Forecasting Demand for New Products - Criteria of Good Forecasting Method - Method of Forecasting - Recent Trends in Demand Forecasting.

UNIT-III: PRODUCTION AND COST ANALYSIS

Production - Production Function - Types of Production Function - Managerial Use of Production - Production Function Linear Homogeneous Production Function - Cob-Doughlas Production Function Laws of production Cost Concept and Definition, MC and AC relationship - Cost Classification - Cost - Output Relationship - How to SAC from LAC - Cost control - Cost Reduction.

UNIT-IV: PRICING METHODS

Pricing Methods - Full Cost Pricing - Target pricing - Going Rate Pricing - Differential Pricing - Specific Pricing - Pricing of New Product - Pricing by Manufactures and pricing by Retailers - Price Regulations - Dual Pricing - Market pricing - Scale Pricing Maintenance.

UNIT-V: PROFIT THEORY

Theories of Profit - Measurement of Profit - Profit Planning - Break Even Analysis.

BOOKS FOR REFERENCE

1. Varsney, R.L and Maheswari, K.L "Managerial Economics ".
2. Metha, P.L. "Managerial Economics".
3. R.Cavery, Sudhanayak, Girija and Meenakshi "Managerial Economics ".
4. Joel Dean: "Managerial Economics".
5. Baumol William. J "Price Theory and Operation Analysis".
6. Hall.R.L and Hitch. C.J. "Price Theory and Business ehavior.
7. Dwivdi. D.N. "Managerial Economics".
8. Maheswari. R.P. and Gupta "Business Government and Socity".

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
B.A ECONOMICS (SEMESTER-V)
Skill Base: HUMAN RESOURCE DEVELOPMENT
Subject Code: 17U5ECSB
CBCS – PATTERN (With effect from 2017-18)

UNIT-I: FRAME WORK FOR HUMAN RESOURCE MANAGEMENT

Meaning - Definition - Objectives - Scope - Functions - Role of Human resource Manager - Difference between Human Resource Management and Personnel Management.

UNIT-II: HUMAN RESOURCE MANAGEMENT

Human Resource Planning - Job Analysis - Job Design - Recruitment - Selection and Selection Process - Induction - Placement - Promotion and Demotion - Transfer.

UNIT-III: TRAINING AND DEVELOPMENT

Concepts of Training - Need and Importance - Steps in Training Programme - Evaluation of Training Programme - Concepts of Management Development programme - Techniques of Training and Development.

UNIT-IV: WAGE AND SALARY ADMINISTRATION

 Components of Remuneration - Wage and Salary Administration - Wage Determination Process - Factors Affecting Wages - Job Evaluation: Meaning - Objectives - Principles - Steps in Job Evaluation - Methods of Job Evaluation.

UNIT-V: PERFORMANCE APPRAISAL AND QWL

Meaning - Definition - Objectives of Performance Appraisal - Appraisal Process - Methods - Quality of Work Life (QWL) - Quality Circle - Management by Objective.

BOOKS FOR REFERENCE

1) Aswathaqppa.K , Human Resource and Personnel Management , S.Chand And Company, New Delhi.
2) Tripatti.P.C., Human Resource Management, Vrinda PUBLICATIONS Pvt. Ltd Delhi.
3) Randy L. Desimone and John Werner, Human Resource Management, Oxford University Press, New Delhi.
4) Biswanth Ghosh, Human Resources Development and Management, McGraw Hill, New Delhi.
5) Wayne F. Cascio , Managing Human Resources , Oxford University Press, New Delhi.
6) Gupta, C.P, Human Resources Management, Sulthan and .Chand, Publication, New Delhi.

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
B.A ECONOMICS (SEMESTER-VI)
Core XII: MACRO ECONOMICS - II
Subject Code: 17U6EC12
CBCS – PATTERN (With effect from 2017-18)

UNIT-I: THE INVESTMENT FUNCTION

Meaning of Capital and Investment - Types of Investment (Induced vs Autonomous), Determinants of Investment - Marginal Efficiency of Capital (MEC) - Relation between MEC and MEI - Factors other than the interest rate affecting inducement to invest.

UNIT-II: THE CONCEPT OF MULTIPLIER

The Investment Multiplier - Working of the Multiplier - Assumptions to Multiplier- Leakages of Multiplier - Criticism of Multiplier - Dynamic Multiplier - Employment Multiplier.

UNIT-III: BALANCED BUDGET MULTIPLIER AND FOREIGN TRADE MULTIPLIER

Balanced Budget Multiplier - Assumptions, Criticism - Foreign Trade Multiplier - Criticism of the Foreign Trade Multiplier.

UNIT-IV: THE PRINCIPLES OF ACCELERATION AND SUPER MULTIPLIER

Acceleration - Meaning - The principles of Acceleration - Operation of the Acceleration principle - Assumptions-Criticism - The Super Multiplier or the Multiplier and Accelerator Interaction - Use of Multiplier and Acceleration interaction in Business Cycles.

UNIT-V: GENERAL EQUILIBRIUM

General Equilibrium: Hicks - Hansen Analysis - Derivation of IS-LM Curves - Keynes effect and Pigou effect - IS-LM Equilibrium - Objectives of Macro Economic Policy - Monetary and Fiscal Policy Measures.

BOOKS FOR REFERENCE

1. M.L. Jhingan, Macro Economic Theory, Vrinda Publications (P) Ltd, New Delhi-110091
2. Dwivedi, D.N., Macro Economics: Theory and Policy, Tata McGraw Hill Publishing Company Ltd., New Delhi.
3. Sankaran,S. , Macro Economics, Margham Publications Chennai.
4. Ahuja, H.L., Macro Economics Theory and Policy – Advanced Analysis, S. Chand & Company Ltd, New Delhi.
5. Gupta, K.R., Mandal, R.K.and Anitha Gupta, Macro Economics, Atlantic Publishers, New Delhi.

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
B.A ECONOMICS (SEMESTER-VI)
Core XIII: FISCAL ECONOMICS -II
Subject Code: 17U6EC13
CBCS – PATTERN (With effect from 2017-18)

UNIT-I: BUDGET

Meaning - Objectives of Budgeting - Principles of Budgeting - Qualities of a Good Budget - Revenue and Capital Budget - Performance Budgeting and Success of Performance Budgeting - Zero-based budgeting.

UNIT-II: DEFICIT FINANCING

Meaning - Objectives - Ways and Means of Deficit Financing - Growth of Deficit Financing - Role of Deficit Financing in Promoting Economic Development in Developing Countries like India - Effect on Money Supply, Price and Distribution.

UNIT-III: FISCAL POLICY
Meaning - Objectives - Instruments of Fiscal Policy - Concept of Sound Finance and Functional Finance - Role of Fiscal Policy in India.

UNIT-IV: FEDERAL FINANCE
Meaning - Features of Federal Finance - Centre and State Financial Relations - Methods of Adjustments - Finance Commission - Functions - Recommendations of Finance Commissions - 14th Finance Commission.

UNIT-V: LOCAL FINANCE
Meaning - Functions and Resources of Local Bodies - Taxes of Local Bodies - Problems of Local Finance.

BOOKS FOR REFERENCE

1. Tyagi B.P "Public Finance," Jai Prakash Natu & Co, Meerut,7th Edition.
2. Singh S.K. "Public Finance in Theory and Practices," Sultan Chand & Co.
3. Srivastava D.K., "Issues in Indian Public Finance," New Century Publications.
4. Musgrave and Musgrave, Public Finance Theory and Practicals

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS) ,VELLORE-2
B.A ECONOMICS (SEMESTER-VI)
Core XIV: TAMIL NADU ECONOMY
Subject Code: 17U6EC14
CBCS – PATTERN (With effect from 2017-18)

UNIT-I: GEOGRAPHY & DEMOGRAPHY

Physical Features - Land Utilizations - Soil - Minerals-Forest - Costal - Population - Density - Sex Ratio - Literacy - Birth Rate - Death Rate - Life Expectancy at Birth.

UNIT-II: STATE OF THE ECONOMY

State Income - SGDP - Sectoral Composition of SGDP - Economic Growth Rate - Economic Planning - State Finance - Revenue - Expenditure.

UNIT-III: AGRICULTURE AND INDUSTRIAL DEVELOPMENT

Agricultural Growth - Cropping Pattern - Use of Inputs - Irrigation - Agricultural Marketing-Livestock - Industrial Pattern - Major Industries - Cotton - Sugar - Cement - Leather -Automobile - Special Economic Zone.

UNIT-IV: SERVICE SECTOR

Infrastructure - Energy - Power - Transportation - Urban Infrastructure - Communication and Banking.

UNIT-V: HUMAN CAPITAL

Occupational Pattern - Employment and Unemployment - Poverty - Education - Health and Nutrition - Water Supply and Sanitation.

BOOKS FOR REFERENCE

1. Tamil Nadu Economic Appraisal
2. Tamil Nadu Economy- MIDS Publication
3. Tamil Nadu Economy: Dr. Lenod

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
B.A ECONOMICS (SEMESTER-VI)
Core XV: HISTORY OF ECONOMIC THOUGHT
Subject Code: 17U6EC15
CBCS – PATTERN (With effect from 2017-18)

UNIT-I: EVOLUTIONS OF ECONOMIC IDEAS

Meaning - Definition - Significance of History of Economic Thought Nature Scope of Economic Thought - Mercantilism - Physiocracy - Comparison of Mercantilism and Physicocracy.

UNIT-II: CLASSICAL AND NEO-CLASSICAL THOUGHT

Classical School of Economic Thought - Adam Smith - Marshall - Malthus - Riccardo - J.S. Mill - Karl Marx - J.B.Say. Neo-classicism (Marshall and Cambridge School) - Alfred Marshall (1844-1924) - Wicksell (19851-1926).

UNIT-III: MODERN ECONOMIC THOUGHT

Modern School of Economic Thought - Keynes and Post Keynesian Revolution - Welfare School of Economic Thought: Pigou - Hicks - Pareto.

UNIT-IV: INDIAN POLITICAL ECONOMIC THOUGHT

Indian Economic Thought - Thirukural and Asthasathiam D. Naoroji - Ranade - Gokhale .

UNIT-V: INDIAN ECONOMIC THOUGHT

Indian Economic Thought - B.R.Ambedkar - M. K. Gandhi - Nehru - K.N. Rajaji - V.K.R.V.Rao - A.K Sen - APJ Abdul Kalam - Current Nobel Laureates in Economics in View.

BOOKS FOR REFERENCE

1. E.Roll – *History of Economic Thought*.
2. A. Grey – *Development of Economic Doctrines*.
3. L.H.Haney – *History of Economic Thought*.
4. Dr. V. Loganatham – *Indian Economic Thought*.

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
B.A ECONOMICS (SEMESTER-VI)
Elective III: LABOUR ECONOMICS
Subject Code: 17U6ECE3
CBCS – PATTERN (With effect from 2017-18)

UNIT-I: LABOUR ECONOMICS

Meaning - Scope - Importance of Labour Economics - Labour Force - Labour Market.

UNIT- II: INDIAN LABOUR MARKET

Characteristics of the Indian Labour Market - Child Labour and Female Labour - Problems and Measures - Globalisation and Indian Labour Market - Labour Market Reforms.

UNIT-III: TRADE UNIONISM

Definition and Functions of Trade Unions - Historical Evolution of Trade Unions in India and Their Present Status - Problems of Trade Unions in India - Role of Outside Leadership.

UNIT-VI: INDUSTRIAL RELATIONS

Causes of Industrial Disputes and Their Settlement Mechanism - Collective Bargaining - Concept, Features, Importance and Pre-requisites for Successful Collective Bargaining- Collective Bargaining in India - Workers' Participation in Management - Concept, Objectives and Forms of Workers' Participation in India.

UNIT-V: LABOUR WELFARE AND SOCIAL SECURITY

Concept, Theories and Principles of Labour Welfare - Agencies for Labour Welfare - Role of the Labour Welfare Officer - Social Security - Concept; Social Assistance and Social Insurance - Social Security Measures in India - International Labour Organisation and Its Impact on Indian Labour Legislations.

BOOKS FOR REFERENCE

1. Agrawal A.N., Indian Economy, New Age International Publishers, New Delhi
2. Datt R. and Sundaram K.P.M., Indian Economy, S.Chand & Co., New Delhi
3. Mamoria C.B. and Mamoria S., Dynamics of Industrial Relations, Himalaya Publishing House, Mumbai Mishra S.K. and Puri V.K., Indian Economy, Himalaya Publishing House, Mumbai
4. Monappa A, Industrial Relations, Tata McGraw Hill Publishing Company Ltd., New Delhi
5. Punekar S.D., Deodhar S.B. and Sankaran Saraswathi , 'Labour Welfare, Trade Unionism and Industrial Relations'.
6. Ratna Sen, Industrial Relations in India - Shifting Paradigms, Macmillan, New Delhi
7. Singh J.K., Labour Economics – Principles, Problems and Practices, Deep and Deep Publications Pvt. Ltd., New Delhi
8. Sinha P.R.N., Sinha I.B. and Shekar S.P., Industrial Relations, Trade Unions and Labour Legislation, Pearson Education, New Delhi
9. Sarma A.M., Industrial Relations, Himalaya Publishing House, Mumbai

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
B.A ECONOMICS (SEMESTER-VI)
Skill Base: ECONOMICS OF SOCIAL ISSUES
Subject Code: 17U6ECSB
CBCS – PATTERN (With effect from 2017-18)

UNIT-I: SOCIAL PROBLEMS: CONCEPT AND APPROACHES

The Concept of Social Problems - Characteristics of Social Problems - Reactions to Social Problems - Causes of Social Problems - Stages in the Development of a Social Problems - Solving Social Problems - Social Problems & Social Change in India.

UNIT-II: POVERTY

The Concept - Manifestation or Measurements-Incidence and Magnitude - Causes - Rural Poverty - Causes of Rural Poverty - Some Effective Strategies for Alleviating Rural Poverty -Problems of the Poor and the Pains of Poverty - Strategies for Alleviating Poverty - Five Year Plans.

UNIT-III: UNEMPLOYMENT

Magnitude - Present Features of Unemployment in India - Types - Causes - Consequences-Measures Taken to Control Unemployment - Evaluation of Measures Adopted - Rural Unemployment - Population Explosion: Increased in Population - Causes of Population Growth - Effects of Population Explosion - Population Policy - Family Planning - New Approach - Swaminathan Committee - Measures Suggested to Control Population Explosionrole of NGOs.

UNIT-IV: COMMUNALISM, SECULARISM AND REGIONALIZATION

Concept of Communalism - Communalism in India - Communal Violence - National Integration Movement for Containing Communal Classes - Theories of Communal Violence - Role of the Police - Secularism - Regionalization - Prescriptive Measures to Meet Communalism.

UNIT-V: CHILD ABUSE AND CHILD LABOUR

Child Population and the Working Children - Concept and Types of Child Abuse - Incidence of Child Abuses - Theoretical Explanations of Child Abuse - Victims of Abuse - Causes of Child Abuse - Effects Abuse on Children - Problems of Child Labour.

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-632 002
DEPARTMENT OF ECONOMICS
UG-Board of Study Meeting

The Board of Studies meeting for BA., Economics   was held on 21-03-2017 at 11. am in the Department of Economics, Muthurangam Govt. Arts College, Vellore. The members attended are as followes.

S.No	Name	Signature

The Board framed the syllabus for the course of BA Economics under CBCS pattern. The detailed syllabus is furnished separately.

Signature of the Members Present:

1. **Chairman**   6.

2.   7.

3.   8.

4.   9.

5.   10.

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
DEPARTMENT OF ECONOMICS
UG-DEGREE COURSES
B.A (ECONOMICS)
CBCS – PATTERN (With effect from 2017-18)

SEMESTER -I

I year/Semester	Part	Subject	Paper Code	Title of the Paper	Hours Weekly	Credit	Exam/Hrs	Max Marks		
								IA	EA	Total
Semester -I	III	Core – I	12U1EC1	Micro Economics – I	5	4	3	25	75	100
	III	Core –II	12U1EC2	Elementary Statistics for Economics - I	5	4	3	25	75	100
	III	Allied - I	12UIAEC1	Rural Economy	6	5	3	25	75	100
	IV	Compulsory	12UIENV	Environmental Studies	2	2	3	25	75	100

I.   Signature of University Nominee   III. Signature of Members

1.

II.   Signature of Chairman   2.

3.

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
DEPARTMENT OF ECONOMICS
UG-DEGREE COURSES
B.A (ECONOMICS)
CBCS – PATTERN (With effect from 2017-18)

SEMESTER –II

I year /Semester	Part	Subject	Paper Code	Title Of The Paper	Hours Weekly	Credit	Exam/Hrs	Max Marks		
								IA	EA	Total
Semester - II	III	Core –III	12U2EC3	Micro Economics - II	5	5	3	25	75	100
	III	Core – IV	12U2EC4	Elementary Statistics for Economics - II	5	4	3	25	75	100
	III	Allied – II	12U2AEC2	Principles of Marketing	6	4	3	25	75	100
	V		12U2VE	Value Education(General Awareness)	2	2	3	25	75	100

I.   Signature of University Nominee   III. Signature of Members

1.

II.   Signature of Chairman   2.

3.

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
DEPARTMENT OF ECONOMICS
UG-DEGREE COURSES
B.A (ECONOMICS)
CBCS – PATTERN (With effect from 2017-18)

SEMESTER –III

Year/Semester	Part	Subject	Paper code	Title of the paper	Hours Weekly	Credit	Exam/hrs	Max Marks		
								IA	EA	Total
II Year /Semester -III	III	Core - V	12U3EC5	Indian Economic Development I	4	4	3	25	75	100
	III	Core - VI	12U3EC6	Monetary Economics - I	4	5	3	25	75	100
	III	Allied -III	12U3AEC3	Mathematics for Economics	5	4	3	25	75	100
	III	SB - I	12U3ECSB	Entrepreneurial Development	3	3	3	25	75	100
	III	NM(Non Major)	12U3ECNM	General Economics - I	2	2	3	25	75	100

I.   Signature of University Nominee   III. Signature of Members

1.

II. Signature of Chairman   2.

3.

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
DEPARTMENT OF ECONOMICS
UG-DEGREE COURSES
B.A (ECONOMICS)
CBCS – PATTERN (With effect from 2017-18)

SEMESTER –IV

Year/Semester	Part	Subject	Paper code	Title of the paper	Hours Weekly	Credit	Exam/hrs	Max Marks		
								IA	EA	Total
II Year /Semester -IV	III	Core - VII	12U4EC7	Indian Economic Development	4	4	3	25	75	100
	III	Core - VIII	12U4EC8	Monetary Economics - II	4	5	3	25	75	100
	III	Allied -IV	12UAEC4	Industrial Economics	5	4	3	25	75	100
	III	SB - II	12U4ECSB	Economics of Insurance	3	3	3	25	75	100
	III	NM(Non Major)	12U4ECNM	General Economics - II	2	2	3	25	75	100

I.   Signature of University Nominee   III. Signature of Members

                                                                        1.

II.   Signature of Chairman   2.

                                                                        3.

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
DEPARTMENT OF ECONOMICS
UG-DEGREE COURSES
B.A (ECONOMICS)
CBCS – PATTERN (With effect from 2017-18)

SEMESTER –V

Year/Semester	Part	Subject	Paper code	Title Of the Paper	Hours Weekly	Credit	Exam/hrs	Max Marks		
								IA	EA	Total
III Year/Semester -V	III	Core –IX	12U5EC9	Macro Economics – I	6	4	3	25	75	100
	III	Core –X	12U5EC10	Fiscal Economics – I	6	4	3	25	75	100
	III	Core -XI	12U5EC11	Environmental Economics	5	4	3	25	75	100
	III	Elective -I	12U5ECE1	Health Economics	5	4	3	25	75	100
	III	Elective-II	12U5ECE2	Managerial Economics	5	4	3	25	75	100
	IV	SB - III	12U5ECSB	Human Resource Development	3	3	3	25	75	100

I.   Signature of University Nominee   III. Signature of Members

1.

II.   Signature of Chairman   2.

3.

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2
DEPARTMENT OF ECONOMICS
UG-DEGREE COURSES
B.A (ECONOMICS)
CBCS – PATTERN (With effect from 2017-18)

SEMESTER –VI

Year/Semester	Part	Subject	Paper Code	Title of the Paper	Hours/ weekly	Credit	Exam/hrs	Max Marks		
								IA	EA	Total
III Year/Semester -VI	III	Core –XII	12U6EC12	Macro Economics - II	6	5	3	25	75	100
	III	Core -XIII	12U6EC13	Fiscal Economics - II	6	5	3	25	75	100
	III	Core -XIV	12U6EC14	Economic Development of Tamilnadu	5	5	3	25	75	100
	III	Core -XV	12U6EC15	Economic Thought	5	5	3	25	75	100
	Elective-III	Elective-III	12U6ECE3	Labour Economics	5	4	3	25	75	100
	SB-IV	SB-IV	12U6ECSB	Economics of Social Issues	3	3	3	25	75	100

I.   Signature of University Nominee   III. Signature of Members

                                                    1.

II.   Signature of Chairman   2.

                                                    3.

Year/Semester	Subject	Paper Code	Title of the Paper	Hrs/Weekly	Credit	Exam/Hrs	Marks IA	Marks EA	Marks Total
I YEAR/I SEMESSTER	Core - I	17P1EC1	Microeconomic Theory I	6	5	3	25	75	100
	Core - II	17P1EC2	Macroeconomic Theory I	6	5	3	25	75	100
	Core - III	17P1EC3	Statistics For Economics	6	4	3	25	75	100
	Core - IV	17P1EC4	Public Finance I	6	4	3	25	75	100
	Elective - I	17P1EEC	Managerial Economics	6	4	3	25	75	100
			TOTAL	30	22	15	125	375	500
I YEAR/II SEMESSTER	Core - V	17P2EC5	Microeconomic Theory II	6	5	3	25	75	100
	Core - VI	17P2EC6	Macroeconomic Theory II	6	5	3	25	75	100
	Core - VII	17P2EC7	Mathematics for Economics	6	4	3	25	75	100
	Core - VIII	17P2EC8	Public Finance II	6	4	3	25	75	100
	Elective - II	17P2EEC	Agricultural Economics	6	4	3	25	75	100
		17P2HR	Human Rights	2	2	3	25	75	100
			TOTAL	32	24	18	150	458	600
II YEAR/III SEMESSTER	Core - IX	17P3EC9	Development Economics I	6	4	3	25	75	100
	Core - X	17P3EC10	Monetary Economics	5	4	3	25	75	100
	Core - XI	17P3EC11	Econometrics	6	4	3	25	75	100
	Core - XII	17P3EC12	International Economics I	6	4	3	25	75	100
	Core - XIII	17P3EC13	Research Methodology	6	4	3	25	75	100
	Elective - III	17P3EEC	Industrial Economics	5	4	3	25	75	100
			TOTAL	**34**	**24**	**18**	**150**	**450**	**600**
II YEAR	Core - XIV	17P4EC14	International Economics II	6	4	3	25	75	100

				6	4	3	25	75	100
Core - XV	17P4EC15	Indian Economic Development		6	4	3	25	75	100
Core - XVI	17P4EC16	Human Resource Development		6	4	3	25	75	100
Core - XVII	17P4EC17	Environment Economics		6	4	3	25	75	100
Elective - IV	17P4EEC	Labour Economics		6	4	3	25	75	100
			TOTAL	30	**20**	**15**	**125**	**3 75**	**500**
			GRANT TOTAL	125	**90**	**66**			**2200**

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS)
VELLORE-2

I M.A. ECONOMICS (I SEMESTER)
CORE COURSE –I: MICROEONOMICS THEORY-I

UNIT –I: Introduction of Micro Economic Analysis

Introduction – Micro Economics – Macro Economics – Distinguish Between Micro and Macro Economics - Problems of Integration and Integration of the Two Approaches: What is Economy – The Vital Process of the Economy : Central Problems of the Economy

UNIT-II: Utility Analysis

Cardinal Utility Approach – Indifference Curve Analysis – Revealed Preference Theory of Demand – Hicksian Revised Theory

UNIT-III: Production and Cost Analysis

Iso - quant's – Properties of Iso-quants – Iso Cost Curve – Cobb Douglas Production Function – The CES Production Function – Nature of Cost – Production Cost –Cost Classification-Cost-Out Relation

UNIT-IV: Market Structure -I

Meaning of Market - Market Structure: Perfect Competition – Monopoly Price Discrimination – Monopsony and Bilateral Monopoly

UNIT-V: Market Structure -II

Monopolistic Competition : Product Discrimination of a Firm – Excess Capacity – Selling Cost – Duopoly: Edgeworth Model – Conrnot Model – Chamberlin Model – Oligopoly: Price Determination Under Oligopoly

BOOKS FOR REFERENCE

1. Stonier & Hague   : Text book of Economic Theory
2. Mc Connel & Gupta : Economics
3. R.Leftwitch   :Price System and Resource Allocation
4. Watson   : Price Theory and its Uses
5. P.A Samuelson   : Economics
6. Bell and Todaro   : Economic Theory
7. Richard A. Bilas   : Micro Economic Theory
8. Dominick and Salvators : Micro Economics
9. Joan Robinson and Eatwell : Introduction to Positive economics

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VELLORE-2

I M.A. ECONOMICS (I SEMESTER)
CORE COURSE –II: MACROECONOMICS THEORY-I

Unit I National Income Accounting
Accounting structure, key concepts in accounting for both closed and open economies – gross national product, gross domestic product, net national product, national income, savings and investment, balance of payments, circular flow of income, computational problems – expenditure approach, income approach and value added approach for measurement, input-output tables

Unit II Keynesian Models
Simple Keynesian Model, assumptions, concepts of involuntary unemployment, liquidity preference, paradox of thrift, investment function, IS-LM model – two sector model, goods and money market equilibrium, multiplier, liquidity trap, complete Keynesian model – three sector model, role of government in terms of monetary and fiscal policy

Unit III Keynesian Models versus Classical Models
Says Law, quantity theory of money, price flexibility and full employment, Clowers and Patinkin'smoney demand functions, equilibrium concept in classical model, synthesis between classical models and Keynesian models, interpretation and policy analysis

Unit IV Expectations and Macroeconomic Adjustments
Expectations formations – Adaptive and rational expectations hypothesis, partial adjustment model, Lucas critique, Phillips curve, rules versus discretion, time consistency, inflation targeting, interest rate rules, effects of spending and taxes in models with flexible and sticky prices, perverse effects of fiscal expansion

Unit V Macroeconomics: Open Economy Aspects
Market for foreign exchange, devaluation and depreciation, real and nominal exchange rate, factors affecting exchange rate, Mundell-Fleming model, fixed versus floating exchange rate, price adjustment, role of fiscal and monetary policies under alternative exchange rate regimes, purchasing power parity concept

Reference
• Scarth, W., *Macroeconomics: An Introduction to Advanced Methods*, third edition, Thomson, 2007
• Mankiw, N. G., *Macroeconomics*, fifth edition, Worth Publishers, 2002
• Hall, E. and Taylor, J. B. *Macroeconomics*. W. W. Norton and Company, 1986
• Barro, R.J. *Macroeconomics*, Fifth edition, MIT Press 1997

R.D Gupta and AS Rana (2015); Keynes Post-Keynesian Economics

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VELLORE-2

I M.A. ECONOMICS (I SEMESTER)
CORE COURSE –III: STATISTIS FOR ECONOMICS

Unit I: Basic Statistics:

Definition, Importance, and Limitation of Statistics-Data-Types-Methods of Data Collection-Sampling and non-Sampling Error-Collection, and presentation of data.

Unit II: Measures of central tendency and Dispersion –

Mean, median, mode, Standard deviation, Variance, Covariance and correlation co-efficiencies. Correlation and regression analysis.

Unit III: Theory of Probability

Probability, Distribution, Events Spaces- Joint marginal and conditional probability under conditions of certainity and uncertainity- Random variable: Expectation and distribution.-Addition and multiplication reorders.-Probability Distinction, Discrete and condtions and expended values

Unit IV: Probability Distinction Function

Binomial, Poission, Normal T-Test, Chi-square.

Unit V: Statistical estimation and testing of Hypothesis.

Types of Estimations and their properties-Sampling distribution for sample mean and proportion. Point and interval estimation- Hypothesis- Level of significant and level of confidence, confidence limits and in region- Test of significance Type I and II Error.

Reference

S.P.Gupta – Statistical Methods.

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VELLORE-2

I M.A. ECONOMICS (I SEMESTER)
CORE COURSE –IV: PUBLIC FINANCE-I

Unit-1: Introduction to Public Economics

Meaning - Nature - Scope - Significance of public economics - Role of the Government in Economic activity - Allocation, distribution and stabilization functions - Private, Public and Merit goods - Private and public mechanism for allocating resources - Problems for allocating resources - Problems of preference revelation and aggregation of preferences(contributions of Samuelson and Musgrave).

Unit-2: Public Expenditure

Meaning- Structure and growth of public expenditure -Canons of public expenditure-Effects- Musgrave's views of public expenditure- Pure theories of public expenditure-Role of public expenditure in economic development and growth- Theories of Public Expenditure- Wagner- Wiseman-Peacock- Reforms in public expenditure.

Unit-3: Public Revenue

Meaning-Sources of public revenue - Classifications of public revenue- Types of tax –Principles of tax - Direct tax and indirect tax- Canons of taxation-Effects of taxation.

Unit-4: Taxation Theory

Shifting and Incidence- Alternative concepts of incidence, Allocative and equity aspects of individual taxes, Benefit and Ability to pay approaches- Theory of optimal taxation- Excess burden of taxes - Tradeoff between equity and efficiency- Theory of measurement of dead weight losses- The problem of double taxation- Taxable capacity- tax policy for a developing economy.

Unit-5: Government Budget

Meaning – Principles of Budget- Kinds of Budgets- Long term and short-term budgeting- Zero- base budgeting - Concepts of current and capital account, balanced, surplus, and deficit budgets - Concept of budget deficit vs. fiscal deficit - Revenue Deficit-Budget multipliers- Budgetary trends in India.

References
1. Thagi B.P. Public finance, Jayaprakash and company, Meerut, India
2. Musgrave R.A. and P.A. Musgrave (1976) Public finance in theory and practice
3. Public economics: Theory and Practice (2008) Vishal Publishing Co., Jalandhar, India.
4. Misra and Puri. Indian Economy.
5. Sing S.K, Public Finance in Theory and Practices, Sultan Chand & Co.,India

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I M.A. ECONOMICS (I SEMESTER)
ELECTIVE–I: MANAGERIAL ECONOMICS

UNIT I- OBJECTIVCES OF THE FIRM

Reasons for the existence of Firms and their Functions - objectives of business firms – Alternative Theories of the Firm: Managerial Theory of the Firm: Baumol's Theory of sales Revenue Maximizations; Behavioral Theory of the Firm: Cyert and March Model: Limit Pricing Principle: Contribution of Bains

UNIT II – FORECASTING TECHNIQUE

Collecting information on consumer behavior – Demand Estimation – Demand Forecasting-Types of Forecasting-Methods of Forecasting--Survey Method-Statistical Method-   Statistical Methods-Time Series Analysis – Smoothing Techniques – Barometric Methods.

UNIT III- PRICINTG PRACTICES AND STRATEGIES

Pricing Practices: Types-Cost-Oriented Pricing and Competition Oriented Pricing -Peak- Load pricing, Price over the Life Cycle of the Product, Pricing Technique-Skimming Pricing-Penetration Price- Pricing of Multiple Products – Price Discrimination – Dumping – Transfer pricing

UNIT IV- CAPITAL BUDGETING

Capital Budgeting Process. Capital Budgeting Decision, Factors Influences in Investment Decision, Determination the Size of Capital Budget, Methods of Estimating Cost of Capital-Traditional and Modern Techniques of Investment Appraisal - Sources of Fund for Long – Term Financing, Measurement of Cost.

UNIT V- PROFIT ANALYSIS

Theories of Profit-Rent Theory of Profit-Dynamic Theory of Profit-Innovation Theory of Profit-Risk and Uncertainty Theory of Profit-BEP-Methods of Measuring Profit Feasibility.

REFERENCES

1. Salvatane Dominick, "*Managerial Economics in a Global Economy*", Mcgraw- Hall Inc.., New York, 1993.
2. Mc Guigon R. James, R. Charles Moyer, Frederick H Deb, Harris, "*Managerial Economics Applications, Strategy and Tactics*", South Western, USA, 2002.
3. Petersen, Lewis and Jain, "*Managerial Economics*", 4th edition, Pearson, 2006

4. Thomas Christopher R. and Charles Maurice S. "*Managerial Economics*", Mc Graw-Hill Irwin, 2005. Boston. Keat Paul G. Philip K.Y. Young "*Managerial Economics – Economic- Tools for Today's Decision Makers*", Prentice Hall, New Jersey, 2003.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS)

I M.A. ECONOMICS (II SEMESTER)
CORE COURSE- V: MICROECONOMIC THEORY-II

UNIT-I: Theories of Distribution

Introduction: Personal Distribution and Functional Distribution: Factor Pricing and Product Pricing: Concepts of Factor Productivity and Factor Cost: The Marginal Productivity Theory of Distribution : Factor Pricing Under Perfect Competition: Modern Theory: Factor Pricing under Perfect Competition: The Product Exhaustion Theorem: Meaning and Solution : Euler's Product Exhaustion Theorem: Importance of Product Exhaustion Theorem: Clerk's Production Exhaustion Theorem: Importance of Product Exhaustion Theorem

UNIT-II: General Equilibrium

Partial and General Equilibrium, Walrasian Excess Demand and Input-Output Approaches to General Equilibrium , Existence, Stability and Uniqueness of Equilibrium and General Equilibrium – Two Sector Model _ Relationship Between Relative Commodity and Factor Prices (Stopler-Samuelson Theorem) – Relationship Between Input Mix and Real Factor Prices – Effect of Changes in Factor Supply in Closed Economy – (Rybezynski Theorem) – Production and Consumption - Introduction of Contribution of Arrow and Debneu to General to General Equilibrium Analysis

UNIT-III: Nature of welfare Economics

Introduction: What is Welfare Economics – Economics and General Welfare - - Value Judgments: Positive Economics and Welfare Economics What is Economic Welfare: Relation Between Economic Welfare and National Income: National Income As a Measure of Economic Welfare

UNIT-IV: Pigouvian Welfare Economics and Externalities

Introduction: Meaning of Welfare: Pigovian Welfare Conditions: Analysis of Externalities: Pigou's Ideal Output- Paretian Criterion: The Compensation Criteria: The Social Welfare Function : The Bergson Criterion: Arrows Impossibility Theorem

UNIT-V: Pareto Optimality and Market Failure

Conditions of Pareto Optimality: Market Failure or Non-Attaiment of Pareto Optimality: Trade – off Between Efficiency and Equity : The TTheory of Social Best: Rawl's Theory of Justice: Introduction: The Theory of Justice

BOOKS FOR REFERENCE

1. Stonier & Hague : Text book of Economic Theory
2. Mc Connel & Gupta : Economics
3. R.Leftwitch : Price System and Resource Allocation
4. Watson : Price Theory and its Uses
5. P.A Samuelson : Economics
6. Bell and Todaro : Economic Theory
7. Richard A. Bilas : Micro Economic Theory
8. Dominick and Salvators : Micro Economics
9. Joan Robinson and Eatwell : Introduction to Positive economics
10. Richard G. Lispey : An introduction to positive economics

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS)

I M.A. ECONOMICS (II SEMESTER)
CORE COURSE- VI: MACROECONOMICS THEORY-II

Unit I: Post-Keynesian Economics

The origin of the Problem-Emergence of Post-Keynesian Economics-Salient Features of Post Keynesian Economics-Keynes and Kalecki on Post-Keynesian Economics-Mnisky Financial Instability Hypothesis

Unit II Labour Markets: New Keynesian Perspective

Nominal versus real rigidities, inter-temporal substitution in labor supply, employment relationships, Search theory, natural rate of unemployment-Frictional Unemployment- Structural Unemployment-Cyclical Unemployment-Natural Unemployment--Real GDP and Unemployment Over the Cycle.

Unit III Business Cycles and Inflation

Phases of Business cycle-Monetary theory of business cycle-Hicks Theory of business cycle-Keynes on secular stagnation-Structural Theory of Inflation-Philips curve-Tobin modified Philips curve-Adaptive expectation and rational expectation

Unit IV Macroeconomic Policy-Monetary Policy

Objectives of Monetary Policy-Instrument of monetary policy-monetary policy and BOP-Monetary policy in Developed and Underdeveloped counties.

Unit V Macroeconomic Policy-Fiscal policy

Objectives of fiscal policy-Instrument of fiscal policy-Monetarist Vs Fiscalist-Keynesian –Policy Mix

Books
Romer, D., *Advanced Macroeconomics*, second edition, McGraw-Hill, 2001
Blanchard and Fischer, *Lectures on Macroeconomics*, MIT Press, 1989
Barro, R.J., *Macroeconomics*, Fifth edition, MIT Press 1997
Sargent, T., *Macroeconomic Theory*, Academic Press, 1987.
Pandit, V.N. and K. Krishnamurty, *Macroeconometric Models for India*, Oxford
University Press, 20.

R.D Gupta and AS Rana (2015); Keynes Post-Keynesian Economics

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Module 1: Differential Calculus

Differential Calculus – Relation to Marginal Analysis – Rules of Differentiation: Power rule, Chain rule, Product rule, Quotation rule. Application in Economics: Marginal functions – Average functions – Derive MC from AC.

Module 2: Differentiation continued

Slope of a curve and turning points- Determining Maximum and Minimum points – Intervals along which a function is increasing or decreasing. Economic application: Total, Average, Marginal Revenue Curve – Break Even Point – Profit Maximization for Monopolist.

Module 3: Differentiation Continued

Second order Derivatives – Nature of Curve – Curvature Convex, Concave, Point of Inflexion – Derivatives of Exponential and Logarithmic functions. Application in Economics: Total, Average, Marginal Cost Curve – Elasticity and Derivatives – Indifference Curve – Rate of Commodity Substitutions (RCS).

Module 4: Functions of Several Variables

Technique of Partial Differentiation – First order Partial Derivatives – Second order Partial Derivative – Differentials and small changes. Application in Economics: Production functions – Constant Product Curve – Iso –quants – MRTS.

Module 5: Integration

Definition – Constant of Integration – Basic rules of Integration – Power rule, Exponential Function – Definite Integral and Area under a Curve. Application in Economics: Consumer and Producer Surplus.

Books for Reference:

1. Mehta B.C. and Madnani G.M.K. Mathematics for Economists, Sulthan Chaned & Sons, New Delhi.
2. Bradley, Teresa and Paul Patton (2008), Essential Mathematics for Economics and business, Wiley India, New Delhi.
3. Anthony, Matrix and Norman Biggs (2009) Mathematics for Economics and Finance: Methods and Modeling, Cambridge University Omen, United Kingdom.

4. Raushaw, Geoff (2009), Maths for Economics; 2nd Edition Oxford University Press, New Delhi.

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I M.A. ECONOMICS (II SEMESTER)
CORE COURSE- VIII: PUBLIC FINANCE II

Unit-1: Public Debt

Meaning- Classifications of Public Debt – Sources and effects of public debt- burden of public debt - Classical view of public debt- Compensatory aspect of debt policy- Public borrowings and price level - Crowding out of private investment and activity - Principles of debt management and repayment. Public debt in India.

Unit-2: Deficit Finance

Meaning - Objectives of deficit finance - Role of deficit finance - Economic significance of deficit finance - War finance - Deficit finance in India.

Unit-3: Fiscal Policy

Meaning - Objectives of fiscal policy - Full employment - Anti-inflation - Economic growth - Redistribution of income and wealth - Interdependence of fiscal and monetary policies - budgetary deficits and its implications - Fiscal policy for stabilization - Automatic vs. discretionary stabilization - Alternative measures of resource mobilization and their impact on growth - Distribution and prices - Balanced budget multiplier- Fiscal Reforms in India.

Unit-4: Fiscal federalism

Meaning of Fiscal federalism- Principles of multi-unit finance - Vertical and horizontal imbalances -Assignment of function and sources of revenue - Constitutional provisions - Devolution of resources and grants -Theory of grants - Resource transfer from union to states- Criteria for transfer of resources - Centre-state financial relations in India - Problems state's resources and indebtedness - Transfer of resources from Union and States to local bodies - Fiscal federalism in India.

Unit-5: Issues in India's Fiscal system

Issues in India's Fiscal system - Reports of Finance Commissions in India - Analysis of central and state government budgets -Fiscal crisis and fiscal sector reforms in India's – Trends in Revenue and Expenditure of the Union Government - Trends in Revenue and Expenditure of the State Governments- India's response to Global economic shocks.

References
1. Thagi B.P. Public finance, Jayaprakash and company, Meerut, India
2. Musgrave R.A. and P.A. Musgrave (1976) Public finance in theory and practice
3. Public economics: Theory and Practice (2008) Vishal Publishing Co., Jalandhar, India.
4. Misra and Puri. Indian Economy.
5. Sing S.K, Public Finance in Theory and Practices, Sultan Chand & Co.,India

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I M.A. ECONOMICS (II SEMESTER)
ELECTIVE-II: AGRICULTURAL ECONOMICS

Unit - 1: Agriculture and Economic Development

Nature and scope of agricultural economics - Traditional agriculture and its modernization - Role of agriculture in economic development - Interdependence between agriculture and industry - Agricultural development, poverty and environment.

Unit - 2: Diversification of Rural Economic Activities

Livestock economics - Livestock resources and their productivity - Problems of marketing - White revolution - Fishery and poultry development - Forestry, horticulture and floriculture - Issues and problems in rural industrialization and development of agro-based industries-MGNREP

Unit - 3: Economics of Rural Infrastructure

Use of land, water and energy - Rural transport, communication, banking, extension services, role, modes and problems of rural electrification - Rural social infrastructure - education, health and information dissemination.

Unit - 4: Agricultural Production and Productivity

Agricultural production — Resource use and efficiency - Production function analyses in agriculture - Factor combination and resource substitution - Size of farm and laws of returns — Theoretical and empirical findings; Farm budgeting and cost concepts - Resource use efficiency in traditional agriculture - Technical change, labour absorption and gender issues in agricultural services,

Unit - 5: Land Reforms and Land Policy

Principles of land utilization - Land distribution - Structure and trends - Land values and rent - Land tenures and farming systems - Peasant, capitalist, collective and state farming - Tenancy and crop sharing — Forms, incidence and effects - Land reform measures and performance - Women and land reforms - Problems of marginal and small farmers.

References:

1. Bhaduri, A. (1984), The Economic Structure of Backward Agriculture, Macmillan, Delhi
2. Bilgrami, S.A.R. (1996), Agricultural Economics, Himalaya Publishing House, Delhi.
3. Dantwala, M.L. et.al (1991), Indian Agricultural Development Since Independence, Oxford & IBH, New Delhi.
4. Gulati, A. and T. Kelly (1999), Trade Liberalisation and Indian Agriculture, Oxford University Press, New Delhi.
5. Joshi, P.C. (1975), Land Reforms in India: Trends and Prospects, Allied Publishers, Bombay.
6. Kahlon, A.S. and Tyagi D.S. (1983), Agriculture Price Policy in India, Allied Publishers, New Delhi.

7. Rao, C.H. Hanumantha (1975), Agricultural Growth, Rural Poverty and Environmental Degradation in India, Oxford University Press, New Delhi.
8. Rudra, A. (1982), Indian Agricultural Economics : Myths and Reality, Allied Publishers, New Delhi.
9. Saini, G.R. (1979), Farm Size, Resource Use Efficiency and Income Distribution, Allied Publishers, New Delhi

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VELLORE-2
II M.A. ECONOMICS (III SEMESTER)
CORE COURSE- IX: DEVELOPMENT ECONOMICS I

Unit I: Economic Development and Economic Growth

Evolution of Development Economics-Historical Perspectives-Measurement of Economic Development and Growth- Sustainable Development Strategy-Modern Economic Growth

Unit II- Indian Economic Growth Strategy

Characteristics of Indian Economy -Planning Strategy- Objectives of the Planning-Five Year Plans in India-Structural Adjustment Policy- Foreign Capital and FDI- Nit Aygo- Human Development Index-Inequality in India.

Unit III Classical Theory of Development

Adam Smith Growth Theory-Ricardian Theory of Growth-Mathusian Theory of Growth-Mills Theory of Growth-Karal Marx Theory of Growth Schumpeter.

Unit IV New Theories of Economic Development

Rostow's Theories of Economic Growth-Lewis Theory of Unlimited Supply of Labour –Fei-Rains Theoory-Jorgenson Dual Economy Model-Harris-Todaro Model of Migration Theory-Leibsentein Critical Minimum Effort Thesis- Rosentein-Rodan Big Push Theory-Balance and Unbalanced Growth Theory

Unit V Modern Growth Theories

Harrod-Domar Growth Model-Joan Robinson Model of Growth-Kaldor Model of Growth – Solow Long-run Growth Model-Meade Growth Model

Refrence:

Ray, D., *Development Economics*, Princeton University Press, 1998
• Basu, K., *Analytical Development Economics*, MIT Press**,** 2003
• Bardhan, P. and C. Udry, *Development Microeconomics*, Oxford University Press, 1999
• Agenor, P-R., and P. J. Montiel**,** *Development Macroeconomics*, Princeton University Press, 2008
• Hendrik Van Den Berg and Joshua J Lewer: International Trade and Economic Growth (Prentice Hall of India), Chapter 3: Sections 3.5, 3.6; Chapter 4, Section 4.5;Chapter 6.
M.L Jhingan (2015); 'The Economics of Development and Planning'.

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VELLORE-2
II M.A. ECONOMICS (III SEMESTER)
CORE COURSE- X – MONETARY ECONOMICS

Unit – I:

Barter System - Evolution of Money – Theoretical – and Empirical Definitions - Functions of Money – Neutrality and Non-Neutrality of Money - Role of Money in Capitalist –Socialist Economy – Circular Flow of Money – Monetary Standard

Unit – II:

Classical Theory – Neo Classical Theory – Restatement of the quantity theory of Money – Keynesian Theory of Money and Price – Patinkin's General Equilibrium Model – IS and LM Equilibrium –Cambridge Quantity Theory of Money

Unit-III:

Organization and Structure of Commercial Banks - Functions – Policies and Principles of Commercial Banks – Index Numbers – Credit Creation – Term Structure and Rate of Interest – Inflation and Deflation – Business Cycle – NABARD - RBI

Unit – IV:

Financial Markets – Money and Capital Markets – Financial Intermediaries – Monetary Transmission Mechanism – Demand and Supply of Money - Financial Dualism – SEBI: Primary and Secondary Market Reforms

Unit – V:

Monetary Policy; Meaning – Objectives – Targets – Indicators – Instruments – Types – Time Lags in Monetary Policy – Effectiveness of Monetary and Fiscal Policy - Financial Reforms in India-Demonetarization-Meaning-role-significance

Reference:

Dennis,G.E.C., Monetary Economics, Oxford University Press, 1981

Hanson,J.L, Monetary Theory and Practice, 4/e , Oxford University Press, 1970

Dow,A.C., Monetarism and Inflation, Oxford University Press, 1980

Jhingan,J.L., Monetary Economics, Vrinda Publication Pvt. Ltd, 2011

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VELLORE-2
II M.A. ECONOMICS (III SEMESTER)

Unit – I: Nature and scope of econometrics:

Nature and scope of econometrics - The econometric approach - Statistics and econometrics – Nature and use of econometric models.

Unit – II: Linear Regression:

Two variable regression – Multiple regression – Correlation co-efficient – Multicollinearity – Extensions of linear regression – Functional forms – Dummy variables – Analysis of variance.

Unit – III: Generalized least Squares

Generalized least squares – Heteroscedatic errors – Auto correlation – Errors in variables – Methods of instrumental variable – grouping of observations and grouping of equations.

Unit – IV: Simultaneous Equation Methods

Simultaneous Equation Methods – The problem of identification – Estimation – Two stage least squares – Introduction to limited information and full information – maximum likelihood and three stage least squares.

Unit – V: Illustrations

Since Illustrations of the applications of econometric methods.

Reference

1.Gujanati, Damodar, Babic Econometrics, Singapore : Mc Graw Hill, Inc 1995

2.Johnstrun J. Econometric methods, Singapore : Mc Graw Hill, Inc 1994

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II M.A. ECONOMICS (III SEMESTER)

CORE COURSE- XII: INTERNATIONAL ECONOMICS - I

UNIT – I: BASIC CONCEPTS

Definition –Features of International Trade - Scope and Significance – Difference between Inter-regional Trade and International Trade

UNIT-II: THEORIES OF INTERNATIONAL TRADE - I

Smith's Theory of Absolute Difference in Cost – Ricardo's Theory of Comparative Difference in Costs -   Haberler's Theory of Opportunity Costs – Mill's Reciprocal Demand Theory – Modern Theory of Factor Endowment (HO Theory)

UNIT – III: THEORIES OF INTERNATIONAL TRADE – II

Karvis Theory of Availability - Linder's Theory of Volume of Trade and Demand Pattern - Emmanuel Theory of Unequal Exchange – Kenn's Theory of Human Capital - Vernon's Product Cycle Theory – Stopler-Samuelson Theorem

UNIT – IV: TERMS OF TRADE

Net Barter Terms of Trade – Gross Barter Terms of Trade – Income Terms of Trade – Single Factor Terms of Trade – Double Factor Terms of Trade – Real Cost Terms of Trade - Utility Terms of Trade – Factors Affecting Terms of Trade

UNIT –V: TARIFFS AND QUOTAS

Tariffs: Meaning – Types – Effects of Tariff in Developing Countries – Optimum Tariff and Welfare –Quota: Meaning – Objectives – Types – Effects – Quota Vs Tariff – Non-Tariff Barriers-Imposed on Developing Economics

Reference:

Sodersten. Bo and Reed,G, International Economics, 3/e, OXFORD PUBLICATIO, 1994

Stern, R.M., The Balance of {Payments, OXFORD PUBLICATIO, 1994

Jhingan,M.L., International Economics, Vrinda PiublicationPvt. Ltd.,2016

Wells,S.J., International Economics, Revised Edition, OXFORD PUBLICATIO, 1973

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VELLORE-2
II M.A. ECONOMICS (III SEMESTER)

CORE COURSE- XIII: RESEARCH METHODOLOGY

Unit I: Social Research

Meaning and definition of research – Classification of research (pure, applied, exploratory, descriptive, historical, diagnostic, experimental, qualitative, and quantitative) – Importance, applications, limitations of social science research – multidisciplinary/interdisciplinary approaches - Basic elements of the scientific method

Unit II: Research Problem and Design

Steps in research process - selection of the research topic and formulation of the research problem in Economics - Review of literature – research designs - case study design

Unit III: Data Collection

Sampling design – probability and non-probability sampling – methods of collecting primary data – tools of data collection – sources of secondary data on Indian economy

Unit IV: Data Analysis

Processing of data – hypotheses – procedure for testing hypothesis –basics of important parametric and non-parametric tests – basic awareness of SPSS

Unit V: Interpretation and Preparation of Research Report

Interpretation – drawing conclusions and reporting it – structure of the research report – types of reports – referencing/citation style (APA or AEA or Chicago Manual)

Essential Readings

1. Goode, W. J., &Hatt, P. K. (19812). Methods in social research.McGRaw Hill
2. Bhandarkar, P. L., Wilkinson, T. S., &Laldas, D. K. (2010). *Methodology & Techniques of Social Research*. Himalaya Publishing House.
3. Blaug, M. (1992). *The methodology of economics: Or, how economists explain*. Cambridge University Press.
4. Kothari, C. R. (2004). *Research methodology: Methods and techniques*. New Age International.
5. Kreuger, L., &Neuman, W. L. (2006). *Social Work Research Methods: Qualitative and Quantitative Approaches: with Research Navigator*. Pearson/Allyn and Bacon.
6. Kumar, R. (2012). Research methodology: a step-by-step approach for beginners.Sage.
7. Field, A. (2013). *Discovering statistics using IBM SPSS statistics*. Sage.

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VELLORE-2
II M.A. ECONOMICS (III SEMESTER)
ELECTIVE- III: INDUSTRIAL ECONOMICS

Unit - I: Industrial Economics

Meaning- Scope- Need - Significance of Industrial Economics - Organizational structure of a firm – Objectives of firms – Theories of growth of firms - Determinants of size and profitability – Types of costs: U-shaped and L-shaped - Cost curves.

Unit - II: Industrial Growth in India

Industrial Growth: Trends in Industrial Growth in India - Growth and Problems of Private Industries - Public Sector - Small Scale - Cottage Industries - Industrial sickness - Growth Pattern in Selected Industries: Iron and Steel Industries; Cotton textiles Industries; Sugar Industries; Coal Industries; Engineering goods Industries.

Unit- III : Industrial Finance

Meaning - Scope and Importance of Industrial finance - Sources of Industrial Finance - Foreign capital : Need and Governments Policies (after 1991) - Foreign Direct Investment - Foreign Institutional Investment- Trends in institutional finance for industrial sector.

Unit - IV : Globalization and Indian Industries

Meaning - Significance of globalization - Impact of Globalization on Indian Industries - Trends and pattern of FDI in India - Merger & Acquisition of Indian Industries - Export and import component of Indian industrial sector.

Unit- V : Industrial Policies

Brief Outline of Industrial Policies (1948, 1956, 1977.) - Industrial Policy in 1991- Trends in Industrial Growth after 1991.- Special Economic Zones - Evaluation of Industrial Policies.

REFERENCES :

1. Ahluwalia I. J. Industrial Growth in India- Stagnation Since Mid-Sixties, Oxford University Press,
2. Hay and Morris D. J. (Latest), Industrial Economics- Theory and Evidence, Oxford University Press.
3. Koutsoyiannis A, Modern Microeconomics, ELBS/Macmillan, Hong Kong.

4. Mookherjee Dilip, (Ed.) Indian Industry-Policies and Performance, Oxford University Press, Delhi.
5. Pandey I M. Financial Management, Vikas Publishing House Pvt. Ltd., New Delhi.
6. Vepa R. K. Modern Small Industry in India, Sage Publications.

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VELLORE-2
II M.A. ECONOMICS (IV SEMESTER)

CORE COURSE XIV - INTERNATIONAL ECONOMICS - II

UNIT – I : INTERNATIONAL TRADE EQUILIBRIUM

Production Possibility Curve – Community Indifference Curve- - Offer Curve – Trade Indifference Curve – Box Diagram Samuelson's Factor Price Equalization Theorem

UNIT – II: GRAIN FROM INTERNATIONAL TRADE

Meaning – Potential and Actual Again from International Trade – Measurement of Gain from Trade – Factors Determining the Gain from Trade and Income Distribution – Free Trade – Restricted Trade – Protection Trade - Free Trade Vs Protection Trade

UNIT – III: INTERNATIONAL ECONOMIC INTEGRATION

Theory of Customs Union – ASEAN – NAFTA - SAARC – EEC – SAFTA – New International Economics Order (NIEO) - BRICS

UNIT – IV: INTERNATIONAL MONETARY SYSTEM

Bretton Wood System - Euro-Dollar Market – International Monetary Fund - World Bank – Asian Development Bank - WTO - BRICS New Development Bank

UNIT –V: INTERNATIONAL CAPITAL MOVEMENTS

Foreign Exchange Market – Methods of Foreign Payments – Spot and Forward Exchange Market – Types of International Capital Movements – Factors Affecting International Capital Movements

Reference:

Sodersten. Bo and Reed,G, International Economics, 3/e, OXFORD PUBLICATIO, 1994

Stern, R.M., The Balance of {Payments, OXFORD PUBLICATIO, 1994

Jhingan,M.L., International Economics, Vrinda PiublicationPvt. Ltd.,2016

Wells,S.J., International Economics, Revised Edition, OXFORD PUBLICATIO, 1973

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS)
VELLORE-2
II M.A. ECONOMICS (IV SEMESTER)

CORE COURSE –XV: INDIAN ECONOMIC DEVELOPMENT

Unit I: Economic Planning in India & NITI Aayog

Historical Evolution of Planning in India's –Main Objectives and Strategies of Planning-Five Year Planns in India –Mixed Economy and Planning in India-Critical Evaluation of Planning in India- Function of NITI Aayog

Unit II Economic Reforms in India

Structural Adjustment Policy-Liberalisation-Privatisation-Globalisation-Impact of Globalisation and Indian Economy-First Generation Reforms and Second Generation Reforms- New Industrial Policy 1991- Public Sector Disinvestment

Unit III: WTO and Indian Economy

WTO and Indian Agriculture- Major Issues in Indian Agriculture in WTO- Agricultural Subsidies-Different Boxes-Blue Box-Green Box- S& D Box-Export Subsidies-India's Negotiation with WTO rounds-

Unit IV Indian Financial Market Reforms

Indian Money Market -Indian Capital Market-Banking in India-Banking Sector Reforms-Non-Banking Financial Companies-Financial Regulation-Insurance in India

Unit V Human Development in India

Poverty in India-Unemployment in India-Labour Reforms-Social Sectors Expenditure-New Educational Policy-Health Sector Reforms--Economics and Caste Census.

Reference:

Economic Survey

Indian Economy Performance and Policies By Uma Kapila

Indian Economy Problems and Policies: Datt & Sundaram

Indian Economy: Ramesh Singh

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS)
VELLORE-2
II M.A. ECONOMICS (IV SEMESTER)
CORE COURSE-XVII: ENVIRONMENTAL ECONOMICS
UNIT – I : Introduction

The basic concepts of Environment Economics - Basic theory of Environmental Economics -Efficiency in a private market economy - Imperfect market problems - Kaldor - Hicks compensation Principle - Tragedy of commons.

Unit – II : Natural Resources: Uses and misuses

Land, Water, Air – Mining, petroleum extraction, fishing, forestry – Energy – Pollution: Meaning and forms: Domestic, Solid Waste, Health and Sanitation and Unsafe Drinking Water, Industrial: Air Pollution, Water Pollution, Soil Pollution, Noise Pollution - Soil erosion– Deforestation.

UNIT – III : Environmental Evaluation

Cost - Benefit Analysis: Optimum Pollution - Efficient level of environmental quality - Evaluation of environmental benefit - Direct and indirect methods.

Unit – IV : Environment and Society

Pollution and Environment – Impact of population growth (Trends, Sex ratio, Rural and Urban) on environment – Urbanisation and environment – Poverty and Environment – Culture and Environment – People Participation in Environmental movement.

UNIT – V : Environmental Action

The collective environmental action: Regulation and prohibition Taxes, subsidies and effluent charges, Government protection of environmental services.-Environmental education-Awareness- Movements in India.-

BOOKS FOR REFERENCES

1. Baumol, Willam J. and "Economics, Environmental Policy and the Oates, Wallace E. 1977 Quality of Life", Prentice Hall Inc.
2. Eugine, T. (2006) "Environmental Economics", Virindha Publications (P) Ltd.
3. Handley, Nick, J. Shogren, "Environmental Economics" and Ben White (1999) Macmillan,
4. Karpagam, M. (2005) "Environmental Economics".Sterling Publishes Pvt. Ltd.
5. S.Sankaran: Environmental E economics (2005)Margham Publications, Chennai.
6. Abhijit Dutta, Sunita Dutta and P N Pandey, Environmental Economics A.P.H.Publishing Corporation New Delhi
7. Maddu Raj Environmental Economics (2001) IVY Publishing House , New Delhi

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS)
VELLORE-2
II M.A. ECONOMICS (IV SEMESTER)
ELECTIVE-IV: LABOUR ECONOMICS

Unit – I : Introduction

Meaning – Concept, Significance and Peculiarities of Labour – Nature, Scope and Importance of labour Economics –Labour Force – Labour Market and Characteristics of Indian Labour Market.

Unit – II : Theories of Wages

Marginal Productivity Theory – Theory of collective bargaining – Modern theory of wages – Minimum wage and fair wage – Wage determination in organized and unorganized sector – Wage Differentials.

Unit – III : Employment & Social Security Measures

Employment scenario– emerging trends in employment – features, types & magnitude of unemployment – state policy for employment - Social Security – ILO – Social Security mesures in India – Employees state Insurance Act 1948 – Employees Provident Funds Act 1952 and Public Provident Fund Act 1968

Unit - IV: Industrial Relations

Theories of labour movement — Growth, pattern and structure of labour unions in India - Achievements of labour unions - Causes of industrial disputes and their settlement and prevention mechanism - Role of tripartism - Current trends in collective bargaining - Role of judicial activism - Labour legislation in India - Indian labour laws and practices in relation to international labour standards

.Unit – V : State and Labour

State and social security of labour — Concept of social security and its evolution - Social assistance and social insurance - Review and appraisal of states policies with respect to social security and labour welfare in India - Special problems of labour - Child labour, female labour, Discrimination and gender bias in treatment of labour;

References

1. Datt, G. (1996), Bargaining Power, Wages and Employment: An Analysis of Agricultural Labour Markets in India, Sage Publications, New Delhi.
2. Hajela, P.D. (1998), Labour Restructuring in India: A Critique of the New Economic Policies, Commonwealth Publishers, New Delhi.
3. Jhabvala, R. and R.K. Subrahmanya (Eds.) (2000), The Unorganised Sector : Work Security and Social Protection, Sage Publications, New Delhi.
4. Lester, R.A. (1964), Economics of Labour, (2nd Edition), Macmillan, New York.
5. McConnell, C.R. and S.L. Brue (1986), Contemporary Labour Economics, McGraw-Hill, New York.
6. Papola, T.S., P.P. Ghosh and A.N. Sharma (Eds.) (1993), Labour, employment and Industrial Relations in India, B.R. Publishing Corporation, New Delhi

7. Rosenberg M.R. (1988), Labour Markets in Low Income Countries in Chenery, H.B. and T.N. Srinivasan, (Eds.), The Handbook of Development Economics, North-Holland, New York.

8. Venkata Ratnam, C.S. (2001), Globalization and Labour-Management Relations:Dynamics of Change, Sage Publications/Response Books, New Delhi.

MUTHURANGAM GOVERNMENT ARTS COLLEGE,(AUTONOMOUS)

VELLORE-2

M.Phil ECONOMICS (Full-Time)

Paper-I RESEARCH METHODOLOGY

Unit-I

Research in Economics-Objectives of Research-Research Methods Vs Research Methodology-Criteria of Good Research-Problems of Social Research- Research Process- Deductive and Inductive Methods- Models in Economics.

Unit-II

Research in Modern Economics-Types of Research-Primary and Secondary Data-Methods of Collecting Primary Data-Sample Design, Questionnaire – Interview Schedule-Case Study Methods-Research Design.

Unit-III

Scaling Techniques –Thrustone-Lihert-Guttman-Sociometry-Survery Methods-Analysis of Cross Section Data.

Unit-IV

Hypothesis-Hypothesis Testing-X^2 Test, F-Test, T Test, Analysis Of Variance Partial and Multiple Correlation Coefficient-Regression, Partial and Multiple Regression Factor Analysis.

Unit-V

Report Writing –Requirement and Mechanics of Thesis Writing-Foot Note, Bibliography, and Glossary –Role of Computers in Research Reporting-Criteria a Good Research Report.

Reference Books:

1. Ferber, R.and P.J.Verdon, Research Methods in Economics, Macmillan,
2. Dass D.Gupta, Research Methods in Economics, Delhi,
3. Westway, Scientific Methods, Its Philosophy and Practices, Boookie Bombay,
4. C.R.Kottari, Research Methodology,
5. Festingar Leon and Katz Daniel, Research Methods in Behavioural Sciences,London

Paper-II Economic Theory

UNIT-I

The Place of Theory in Modern Economic Science-Marginalist Analysis-General Equilibrium Theory-Growth Theory- Growth and Distribution Theory-Two sector Equilibrium Model-Geometric treatment with application (e.g.)-International Trade and Economic Development.

UNIT-II

Pareto and Rawls: Efficiency and Equity-social choice-Income distribution and Equality-Behavior under Uncertainty: Expected Utility Hypothesis-Mean Variance Analysis.

UNIT-III

Rudiments of capital theory-Time and Productivity, Stock-Flow Relationship Measurement of Capital-Cambridge controversy-Recent Development in Capital theory-Human capital: Theory of Investments in Educations-Empirical findings.

UNIT-IV

Patinkin-Modern and Other Monetary Models-Monetarist Controversies: Friedman-Gurly and Shaw, Marshall and Tobin, H.Johnson, John Hicks-Stagflation-Brahmanada,Bernstein,I.G.Patel,Vakil.

UNIT-V

Recent trends in the theories of Economics: 1) Welfare economics 2). Health Economics 3) Human resources 4) Urban Economics 5) Environmental Economics 6) Cultural Economics 7) Legal Economics 8)Economics of Poverty

Reference Books:

1. Rudder Dutt and K.P.Sundram, Indian Economy
2. A.N. Aggarwall, Indian Economy
3. Hunt, Economic Theories of Development
4. Naqvi, Development Economics
5. Economic Survey
6. Yojana
7. Khurukshetra.

PG&RESEARCH DEPARTMENT OF ECONOMICS

M.Phil ECONOMICS (Full-Time)

PAPER-III-DEVELOPMENT ECONOMICS

Unit-I

Trends in National Income, Growth and Structure-Demography Concepts-Demographic Transition-Human Development –Human Development Index-Gender Related Development Index-Human Poverty Index-National Human Development Report-Trends of Occupational Pattern in India.

Unit-II

Natural Resources, Economic Development and Environmental Degradation- Energy , Non-Conventional And Conventional Energy Sources-Transport- Road, Rail, Air-Public Sector, Performance, Shortcomings-Disinvestment-Privatization, Models Of Privatization-Foreign Direct Investment.

Unit-III

Poverty-Concept, Poverty Studies-Absolute and Relative Poverty, Poverty Eradication Programmes-Parallel Economy-Unemployment, Schemes to Reduce Unemployment and Underemployment-Causes for Rise in Prices in India-Public Distribution System.

Unit-IV

Place Of Agriculture in The Indian Economy –Causes for Low Productivity-Food Security Irrigation-Tanks, Canals and Ground Water-Agricultural Finance-Institutional Agencies-Cooperatives, Commercial Banks, RRB, NABARD, Industry-Large and Small Scale Industries –GATT-WTO and India's Foreign Trade.

Unit-V

Description of the Candidates Research Problem: Simple and Clear Description of The Research Problem-The Socio-Economic Context-Potential Policy Implication of The Study-Study Goals-Identification of Research Question –Overall Goals of The Study-Literature Reviewed –Research Methods To Be Used (Hypotheses, Theoretical Ideas Underlying The Study Description of The Study Site, Variable to be Measured, Data to be Collected or Collection Methods-Methods for Analysis-Bibliographical Information.

BOOKS FOR REFERENCES:

1.LELYYARD P.R.G &WALTERS.A.A-Micro Economic Theory,Megraha Hill,1973.Chap 1.2.3 12 and 13.

2.JOHNSON.H.G-Two sector Model of general equilibrium-Allen&Unwin 1971,chap.1&2 and Appendix A&B.

3.SEN.A.K.-Growth Economics,Penguin Publication

4.JOHN HICKS-The Crisis in Keynesian Economics, oxford University Press-1973.

5.JOHN HICKS-Capital and time-A new Austrian Theory-Clarndon Press-1973.

6.JOHN HICKS-Capital and Growth. Clarndon press-1965

7.RECKERMAN W-Introduction to National Income.

8.DON PATINKIN-Money, interest and Prices-chap II and XI

9.MULLER.D.C-Public choice-A Survey Journal of economic Literature, June 1973

10.JOHNSON H.G-Further Essays on Monetary Economics.

11.RAWKS-THE Theory of Justice, Harward University Press 1971-Chap1.2.3 and 5

12.BHAGWATI.J. AND CHAKRAVARTHIS.S. -Indian Economic Analysis

13.HIRSHLEFER-Investment, Interest and Capital-Prentice hall.

14.ROBERT PAUL WOLS-Understanding Rawl, Princeton University Press-1977.

15.CHAKRAVARTHY.S "Capital and Development Planning", Cambridge Press 1969.

16.FRIEDMAN.M. "Optimum Quantity of Money and other Essays".

17.BECKER G.S Human Capital, Columbia University Press-1974-Chap 1&2.

18.GREEN HAJ-Consumer theory-Macmillan 1978-chap 11,12,,13 &14

19.ROBERT.V.ROOSA- The Dollar and World Liquidity, Random House 1967.

20.LEWIS ARTHUS W-New International Economic Order, Random House1979.

21.WILLY BRANDT-North South-A Programme for Survival, London 1979.

2

MUTHURANGAM GOVT. ARTS COLLEGE (A) VELLORE – 632 002.

B.Sc., MATHEMATICS

SYALLBUS

UNDER CBCS

(with effect from 2017 – 2018)

PAPER-1
ALGEBRA AND TRIGNOMETRY

UNIT-I: Theory of Equations

Polynomial Equations- Imaginary Roots - Relation between Roots and Coefficients – Symmetric functions of roots – Sum of powers of roots – Transformation of equations.

UNIT-II: Theory of Equations

Standard form of reciprocal equations – Solving reciprocal equations- Descarte's rule of sign – Newton's method – Horner's method.

UNIT-III: Matrices

Symmetric – Skew- Symmetric – Hermitian – Skew-Hermitian – Orthogonal and Unitary matrices with properties - Cayley Hamilton theorem (without proof) – Eigen values and Eigen vectors –Diagonalization of a matrix.

UNIT-IV: Theory of Numbers

Prime number - Composite number - Divisors of a given number - Euler's function $\phi(n)$-Integral part of a real number - The highest power of a prime number p contained in n! - Congruences -Fermat's theorem –Wilson's theorem (without proof) - problems only.

UNIT-V: Trigonometry

Expansion of $\mathrm{Sin}^n\theta$, $\mathrm{Cos}^n\theta$ in terms of multiples of θ - Hyperbolic functions - Inverse hyperbolic functions - Simple problems - Logarithm of a complex number.

Recommended Text

1. T.K.Manicavachagam Pillai &Co. **Algebra**, S.Viswanathan Pub,

2. P.Duraipandian, **Trigonometry,** Emerald Pub,

Reference Books
P.R.Vittal, **Algebra and Trigonometry**, Margham Pub,

PAPER - 2
CALCULUS - I

UNIT-I

nth derivative - Leibnitz's theorem (without proof) - its applications – total differentiation - meaning of the derivative - geometrical interpretation. Jacobians and their properties - Maxima and minima of functions of two and three independent variables - Necessary and sufficient conditions - Lagrange's method (all without proof) - simple problems on these concepts.

UNIT-II

Curvature - Radius of Curvature in Cartesian and Polar Coordinates – p-r Equations, Evolutes - Envelopes.

UNIT-III

Method of finding asymptotes (without proof) - of plane algebraic curves - asymptotes by special cases - asymptotes parallel to the axis - asymptotes by inspection.

UNIT-IV

Method of integration of rational, irrational and trigonometric functions- Integration by parts - Bernoulli's formula.

UNIT-V

Properties of definite integrals - Reduction formulae - simple problems.

Recommended Text
S.Narayanans & T.K.Manicavachagam Pillai, , **Calculus,** S.Viswanathan Pub.

Reference Books
1. Shanti Narayanans, **Differential Calculus**, S.Chand & co.

2. Shanti Narayanan S, **Integral Calculus**, Chand & co.

3. P.R.Vittal, **Calculus**, Margham pub.

ENVIRONMENTAL SCIENCE

UNIT – I : Introduction to Environmental Sciences : Natural Resources

Environmental Sciences – Relevance – Significance – Public awareness – Forest resources – Water resources – Mineral resources – Food resources – Conflicts over resources sharing – Exploitation – Land use pattern – Environmental impact – ferrilizer – Pesticide problems – Case studies.

UNIT – II : Ecosystem, Biodiversity and its Conservation

Ecosystem – Concept – Structure and Function – Producers, Consumers and Decomposers – Food Chain – Food Web – Ecological Pyramids – Energy flow – Forest, Grassland, desert and aquatic Ecosystem.

Biodiversity – Definition – genetic, species and ecosystem diversity – Values and uses of diversity – Biodiversity at global, national (India) and local levels – Hotspots, threats to biodiversity – Conservation of diversity – Insit & Exsitu.

UNIT – III : Environmental Pollution and Management

Environmental Pollution – Causes – Effects and Control measures of Air, Water, Marine, Soil, Solid Waste, Thermal, Nuclear Pollution and Disaster Management – Floods, Earthquake, Cyclone and Land slides. Role of individuals in prevention of pollution – pollution case studies.

UNIT – IV : Social Issues – Human Population

Urban issues – Energy – Water conservation – Environmental Ethics – Global warming – Resettlement and Rehabilition issues – Environmental legislations – Environmental production Act. 1986 – Air, Water, Wildlife and forest conservation Act – Population growth and Explosion – Human rights and value Education – Environmental Health – HIV/AIDS – Role of IT in Environment and Human Health – Women and Child welfare – Public awareness – Case studies.

UNIT – V : Field work

Visit to a local area / local pollutes site / local simple ecosystem – Report submission.

Reference Books

1. Kumarasamay, K., Alagappa Moses .A and Vasanthy.M, (2004). **Environmental studies,** Bharathidsan University Pub. 1, Thichy.

2. Rajamannar, (2004). **Environmental Studies,** EVR College Pub, Trichy.

3. Kalavathy, S. (Ed) (2004), **Environmental Studies.** Bishop Heber College Pub, Trichy.

PAPER – 3
DIFFERENTIAL EQUATIONS

UNIT – I: Ordinary Differential Equations

` First order first degree equation of Bernoulli – First order but not of first degree Equation – solvable for p, solvable for x, solvable for y – Clairaut's form – simple problems.

UNIT – II: Ordinary Differential Equations

Second order linear non-homogeneous equation with constant coefficients of the form $(a\ d^2\ y/dx^2 + b\ dy/dx + cy) = X\ (x)$ where $X(x) = e^{\alpha\ x}\ V(x)$, $V(x) = x^m$, cos mx, sin mx (m is a positive integer). Second order equation with variable coefficients of the form $(ax^2 d^2\ y/dx^2 + bx dy/dx + cy) = X\ (x)$, $(ax+b)^2\ d^2\ y/dx^2 + P_1(ax+b)\ dy\ /\ dx + P_2\ y = X(x)$.

UNIT-III: Ordinary Differential Equations

Method of variation of parameters (second order) – Simple problems – Total differential equation $P\ dx + Q\ dy\ R\ dz = 0$ – Solution of exact equations – Reduction to Exact Differential Equations – Simultaneous Total Differential Equation $dx/P = dy/Q = dz/R$

UNIT-IV: Partial Differential Equations

Formation of PDE by eliminating arbitrary constants and functions – Complete, particular, singular and general integrals – Solutions of standard types: $f(p,q) = 0$, $f(p,q,x)=0$, $f(p,q,y)=0$, $f(p,q,z) = 0$, $f(p, x) = f(q, y)$ – clairaut's form – simple problems.

UNIT-V: PDE

Lagrange's equation – Charpit's method – Simple problems.

Recommended Text
Narayanan & Manikavachagam Pillai, **Calculus**, S.Viswanathan Pub.

Reference Book

1. Shanthi Narayanan, **Integral Calculus,** S.Chand & Co.

2. Dipak Chatterji, **Integral Calculus and Differential Equations,** Tata Mc Graw Hill.

PAPER - 4
CALCULUS-II

UNIT-I

Double integral - some applications to area, surface – change of order of integration.

UNIT-II

Triple Integrals-Applications to volume - transformation to other coordinate system.

UNIT-III

Beta and Gamma functions – Properties - Problems.

UNIT-IV

Laplace Transforms - Properties - Evaluation of certain integrals - Inverse Laplace transforms -Properties

UNIT-V

Method of partial fractions to find Inverse Laplace Transform - Applications to differential equations - Second order ODE with constant coefficients and Simultaneous differential equations – Problems.

Recommended Text
Narayanan & Manikavachagam Pillai, **Calculus**, S.Viswanathan Pub.

Reference Book

1. Shanthi Narayanan, **Integral Calculus,** S.Chand & Co,

2. Dipak Chatterji, **Integral Calculus and Differential Equations,** Tata Mc Graw Hill.

VALUE EDUCATION

UNIT-I

Value education –Definition – Relevance to present day – Concept of Human Values – self introspection – Self-esteem.

UNIT-II

Family values – Components, structures and responsibilities of family – Neutralizations of anger – Adjustability – Threats of family life – Status of women in family and society – Caring for needy and elderly – Times allotment for sharing ideas and concerns.

UNIT – III

Ethical values – Professional ethics – Mass media ethics – Advertising ethics – Influence of ethics on family life –Psychology of children and youth – Leadership Qualities – Personality development.

UNIT – IV

Social values – Faith, service and secularism – Social sense and commitment – Students and Politics – Social awareness, Consumer rights and responsibilities – Redressal mechanisms.

UNIT-V

Effect of international affairs on values of life. Issue of Globalization – Modern welfare – Terrorism. Environmental issues – Mutual respect of different cultures, religious and their beliefs.

Reference Books

1. T.Anchukandam and J.Kuttianimathathil [Ed] Grow Free Live Free, Krisitu Jyoti Publications, Bangalore[1995]

2. Mani Jacob [Ed] Resource Book for Value Education, Institute for Value Education, New Delhi2002.

3. DBINI, NCERT, SCERT, Dharma Bharathi National Institute of Peace and value Education, Secundrabad, 2002.

4. Daniel and Selvamony – Value Education today,[MadrasChristianCollege, Tambaram and ALACHE, New Delhi, 1990].

5. S.Ignascimuthu – Values for Life – Better Yourself Books, Mumbai, 1991.

6. M.M.M.Mascaronhas, Centre for Research Education Science and Training for Family Life Promotion – Family Life Education, Bangalore, 1993

PAPER - 5
ANALYTICAL SOLID GEOMETRY

UNIT-I: Plane

Direction Cosines and Direction ratios - General Equation of a Plane - Normal form of equation of a Plane - Angle between Two Planes - Equation of a plane passing through three non collinear points - Intercept form of an equation of a plane - Distance between parallel planes.

UNIT-II: Planes And Straight Line

System of planes - Bisector plane- Equation of a line in various forms - Symmetric and non-Symmetric forms - Angle between a line and a plane - Perpendicular distance of a point from a plane - Condition for two lines to be coplanar - Skew lines and shortest distance between two skew lines.

UNIT-III: Sphere

Equation of a sphere in standard forms –Section of a sphere by a plane – great and small circles - Sphere through a given circle - Intersection of two spheres – Tangent Plane - Orthogonal Spheres.

UNIT-IV: Cone

Equation of a Cone - Cone with vertex at the origin - Quadric cone with the vertex at the origin - Right circular cone.

UNIT-V: Cylinder

Cylinder - Equation of a Cylinder - Enveloping Cylinder - Right Circular Cylinder.

Recommended Text
T.K.Manickavachagom Pillay and others, (2004), **A Text Book of Analytical Geometry - Part I Two Dimensions**, S.Viswanathan Printers and Pvt. Ltd. Chennai.

Reference Books
1. P. Duraipandian and Laxmi Duraipandiyan, (1965), **Analytical Geometry**- 2D, Asia Publishing Company, Bombay.

2. P. Duraipandian and Laxmi Duraipandiyan, (1975), **Analytical Geometry**-3D, Emerald Publishers, Chennai.

3. G.B.Thomas and R.L.Finney, (1988), **Calculus and Analytical Geometry**, Addison Wesley (9th Edn.), Mass. (Indian Print).

4. P.R.Vittal, (2003), **Coordinate Geometry**, Margham Publishers, Chennai.

SKILL BASED - 1

FUNDAMENTALS OF APPLIED MATHEMATICS

UNIT-I: Recurrence relations and generating functions

An introduction-Polynomials and their evaluations - Recurrence relations.
Chapter - 5: Sections 1-3.

UNIT-II: Recurrence relations and generating functions

Solution of finite order heterogeneous (linear) relations -Solution of Non – homogenous relations.
Chapter - 5: Sections 4 -5.

UNIT-III: Logic

Introduction - TF statements - Connectives - Atomic and Compound statements- Well formed (statement) formulae - Truth table of a formula- Tautology and Contradiction - Tautological implications and equivalence of formulae.
Chapter – 9 Sections 1- 8.

UNIT-IV: Logic

Replacement process - Functionally complete sets of connectives and duality law.
Chapter – 9 Sections 9 – 10.

UNIT-V: Logic

Normal forms - Principal normal forms.
Chapter – 9 Sections 11 - 12.

Recommended Text
M.K.V. Venkataraman, N.Chandrasekaran, **Discrete Mathematics**

Reference Book
Trembley and Manohar, **Discrete Mathematics.**

NON – MAJOR ELECTIVE – 1

BASIC MATHEMATICS

UNIT-I: Sets

Definition - Subsets - Power sets - Equality of sets - Finite and infinite sets - Set operations - De-Morgan's laws - distributive laws.

UNIT-II:

Logical statements - connectives - truth tables - tautology and Contradiction.

Unit - III: Matrices

Definition –operations on matrices- types of matrices – Transpose of a matrix - Symmetric – Skew- Symmetric –Orthogonal matrices.

UNIT-IV: Matrices

Adjoint and inverse of a matrix – Applications – solving nonhomogeneous equations involving two variables.

UNIT-IV: Determinants

Definition – properties (without proof) – application of determinants – Cramer's rule for the solution of a system of equations.

Recommended Text

1. Dr.M.K.Venkataraman and others, **Discrete mathematics and structures** The National Publishing Company, Madras

Reference Book

Gupta, **Discrete Mathematics** Fifth Edn. Pearson Education Asia, New Delhi 2002.

PAPER- 6
VECTOR ANALYSIS

UNIT - I: Differential Vector calculus

Differentiation of a Vector - Geometrical Interpretation of the Derivative - Differentiation Formulae - Differentiation of dot and cross products - Partial Derivatives of Vectors - differentials of Vectors.

UNIT- II: Gradient, Divergence and curl

Vector differential Operator Del – Gradient of a Scalar Function - Directional Derivative - Geometric Interpretation - Gradients of : Sum of functions, Product of functions, Function of a function.

UNIT- III: Gradient, Divergence and curl

Divergence of a Vector and its Physical Interpretation - Curl of a vector and its Physical Interpretation - Expansion formulae for Operators involving Del – Solenoidal, Irrotational vectors.

UNIT- IV: Vector Integration

The Line Integral - Surface Integral and its Physical Meaning - Surface Integral and the concept of divergence of a vector - Equivalence of two Definitions of Divergence.

UNIT-V: Vector Integration

Gauss Divergence Theorem and Green's Theorem (statements only) and problems - Line integral - the concept of the curl of a Vector - Stoke's Theorem (statement only) - Problems.

Recommended Text
B.S.Grewal, **Higher Engineering Mathematics** (2002), Khanna Publishers, New Delhi.

Reference Book

1. G.B.Thomas and R.L.Finney. (1998) **Calculus and Analytical Geometry**, Addison Wesley (9th Edn.), Mass. (Indian Print).

2. M.K.Venkataraman. (1992) **Engineering Mathematics** - Part B. National Publishing Company, Chennai.

3. P.R.Vittal, (2004) **Vector Calculus, Fourier series and Fourier Transforms.** Margham Publication, Chennai.

SKILL BASED - 2

FOURIER ANALYSIS

UNIT-I : Fourier Series

Euler's Formulae - Conditions for Fourier Expansion :$(0, 2\pi)$, $(-\pi,\pi)$ - Functions having Discontinuity - Odd and Even Functions.

UNIT- II : Fourier Series

Change of Intervals : $(0,2l)$, $(-l, l)$ - Half range series.

UNIT- III : Fourier Integral

Definition - Fourier Integral theorem (statement only) - Fourier Integrals - Fourier sine and Cosine Integral - Complex Form of Fourier Integral

UNIT-IV : Fourier Transforms

Fourier Transforms - Properties of Fourier Transforms – Fourier Sine transform and Fourier Cosine Transform.

UNIT - V

Convolution Theorem for Fourier Transforms - Parseval's Identity for Fourier Transforms (without proof) – simple problems.

Recommended Text

S.Narayanan &T.K.Manicavachagam pillai, **Calculus Vol III**, S.Viswanathan Pub.

Reference books

1. B.S.Grewal, **Higher Engineering Mathematics** (2002), Khanna Publishers, New Delhi.

2. G.B.Thomas and R.L.Finney. (1998) **Calculus and Analytical Geometry**, Addison Wesley (9th Edn.), Mass. (Indian Print).

3. M.K.Venkataraman. (1992) **Engineering Mathematics** - Part B. National Publishing Company, Chennai.

4. P.R.Vittal, (2004) **Vector Calculus, Fourier series and Fourier Transforms**. Margham Publication, Chennai.

NON - MAJOR ELECTIVE – 2

FOUNDATION MATHEMATICS FOR COMPETETIVE EXAMINATIONS

UNIT-I: General Arithmetic

L.C.M and G.C.D of numbers - their relations, Ratio and proportions - inverse ratio.

UNIT -II: General Arithmetic, Time Distance and work

Ratio of four numbers - increasing and decreasing order of fractions - percentages – Time, Distance and work.

UNIT -III: Arithmetic Progression & Geometric Progression

A.P and G.P - nth term- summations of series - determination of series in A.P and G.P.

UNIT-IV: Commercial Arithmetic

Simple and compound interest – simple problems, gain and loss percentage.

UNIT-V: Permutations and combinations, Linear Equations

Definition of nP_r, nC_r – simple problems - problems on ages. Formation and solution of linear equations with two variables

Recommended Text
R.S.Agarwal **Quantitative Aptitude,** S.Chand and Co., New Delhi 2008.

Reference Books
1. AbhigitGuha **Quantitative Aptitude for Competitive Examinations** Tata Mc Graw - Hill Pub., Co., New Delhi -II Edn.

2. Edgar Thorpe Course in **Mental Abilities and quantitative Aptitude for competitive Examinations,** Tata McGraw - Hill Pub., Ltd. New Delhi-II Edn.

PAPER - 7
ABSTRACT ALGEBRA

UNIT-I : Group Theory

Definition of a group – some examples of groups – some preliminary lemmas – subgroups.

Sections : 2.1 to 2.4

UNIT-II : Group Theory

A counting principle – Normal subgroups and Quotient groups – Homomorphisms.

Sections : 2.5 to 2.7 (omit applications 1 & 2 in section 2.7)

UNIT – III : Group Theory

Automorphisms -Cayley's Theorem-Permutation Groups.

Sections : 2.8 to 2.10.

UNIT-IV: Ring Theory

Definition and Examples of Rings-Some Special Classes of Rings – Homomorphisms – Ideal and Quotient rings.

Sections : 3.1 to 3.4.

UNIT-V : Ring Theory

More Ideals and Quotient Rings - The Field of Quotients of an Integral Domain-Euclidean Rings.

Sections : 3.5 to 3.7.

Recommended Text
I.N.Herstein, **Topics in Algebra**-John Wiley & Sons, Second edition (2008).

Reference Books
1. S.Arumugam, (2004) **Modern Algebra**, Scitech Publications, Chennai.

2. J.B.Fraleigh(1987), **A First course in Algebra** (3ʳᵈ Edition) Addison Wesley, Mass.(Indian Print).

3. Lloyd R.Jaisingh and Frank Ayres, Jr.(2005) **Abstract Algebra,** (2ⁿᵈ Edition), Tata McGraw Hill Edition, New Delhi.

4. M.L.Santiago (2000) **Modern Algebra**, Tata McGraw Hill Edition, New Delhi.

5. Surjeet Singh and QaziZameeruddin (1982) **Modern Algebra**. Vikas Publishing House Pvt.Ltd.New Delhi.

PAPER - 8
REAL ANALYSIS - I

Unit – I : Sets and functions

      Functions – Real-valued functions –Equivalence, Countability – Real numbers – Least upper bounds.

Chapter - 1 Sections 1.3 – 1.7

Unit – II : Sequences of real numbers

      Definition of sequence and subsequence – Limit of a sequence – Convergent sequences – Divergent sequences – Bounded sequences –Monotone sequences.

Chapter - 2 Sections 2.1 – 2.6

Unit – III : Sequences of real numbers & Series of real numbers

      Operations on convergent sequences – Limit superior and limit inferior – Cauchy sequences – Convergence and divergence – Series with nonnegative terms.

Chapter – 2 & 3 Sections 2.7, 2.9, 2.10, 3.1, 3.2

Unit – IV : Series of real numbers

      Alternating series – Conditional convergence and absolute convergence – Tests for absolute convergence – Series whose terms form a nonincreasing sequence.

Chapter – 3 Sections 3.3 – 3.7 (omit 3.5)

Unit – V : Limits and metric spaces & Continuous functions on metric spaces

      Limit of a function on the real line – Metric spaces – Limits in metric spaces – Functions continuous at a point on the real line – Reformulation.

Chapter – 4 & 5 Sections 4.1 – 4.3 & 5.1, 5.2

Recommended Text
R. Goldberg, **Methods of Real Analysis**-Oxford & IBH Pub.co.New Delhi.

Reference Book
Tom Appostal (1974) - **Mathematical Analysis**, 2nd Edition

PAPER - 9
COMPLEX ANALYSIS

UNIT-I : ANALYTIC FUNCTIONS

Functions of a complex variable – Mappings – Mappings by Exponential functions – Limits – Theorems on limits – Limits involving the point at infinity – Continuity – Derivatives – Differentiation formulas – Cauchy-Riemann equations -sufficient conditions for differentiability - polar coordinates - Analytic functions - harmonic function.
Chapter - 2: Sections 12 – 26.

UNIT- II : INTEGRALS

Derivatives of functions   w(t), definite integrals of functions w(t)- Contours- Contour Integrals – Some examples – Cauchy – Goursat theorems (without proof)- Cauchy integral formula – An Extension of the Cauchy integral formula – Some Consequences of the extension – Liouville's theorem and the fundamental theorem of Algebra – Maximum modulus principle
Chapter - 4: Sections 37 - 41, 46, 50 - 54.

UNIT – III : Series

Convergence of sequence – convergence of series of series –Taylor's series – Proof of Taylor's theorems – Examples – Laurent's series – proof of Laurent's series – Examples.
Chapter - 5 : Sections 55 - 62.

UNIT-IV : Residues and poles

Isolated singular points – Residues – Cauchy's Residue theorem – Residue at Infinity – The three types of isolated singular points – Residues and poles – Examples – zeros of Analytic functions – Zeros and poles – Evaluation of Improper Integrals – Example – Jordan's lemma (statement only)
Chapter - 6: sections 68 - 76, 78 - 81 In section 75 - 76

UNIT - V : Mapping by Elementary functions

Linear Transformations – the Transformation w=1/z   – Linear Fractional transformation – An   Implicit form – mapping of the upper half plane – The transformation w=sinz – mappings by z^2 and branches of $z^{1/2}$ -conformal mapping – preservation of Angles- scale factors
Chapter - 8: Sections 90-97, 101- 102.

Recommended Text

R.V.Churchill and J.W.Brown (2016), **Complex variables and Applications,** McGraw Hill., NewYork.

Reference Books

1. P.Duraipandian and Laxmi Duraipandian (1976), **Complex analysis,** Emerald Pub.,Chennai.

2. S.Ponnusamy (2000), **Foundations of Complex analysis,** Narosa Publishing House, New Delhi.

3. Murray R.Spiegel (2005), **Theory and problems of complex variable**, Tata McGraw Hill, NewDelhi.

PAPER - 10
MECHANICS-I

UNIT – I

Types of forces - Friction – Angle of friction – Laws of friction – Magnitude and direction of the resultant of the forces acting on a particle – Simple problems.
Chapter - 2: Sections: 2.1, 2.2.

UNIT – II

Triangle law of forces – Lami's theorem – Simple problems – Equilibrium of a particle under forces – Moments – General motion of rigid body – Equivalent system of forces – Parallel forces –Simple problems.
Chapter – 3 & 4: Sections 3.1, 4.1 – 4.4.

UNIT – III

Forces along the sides of a triangle – Couples – Resultant of several coplanar forces.
Chapter -4: Sections 4.5 – 4.7.

UNIT – IV

Centre of mass of simple uniform bodies: Triangle lamina - rods forming a triangle trapezium - Centre of gravity of a circular arc, elliptic quadrant – Solid and hollow hemisphere – Solid and hollow cone – Simple problems.
Chapter - 6: Section: 6.1 , 6.2 (6.2.1 & 6.2.2 only).

UNIT – V

Hanging Strings.
Chapter -9 : Sections 9.1 – 9.2.

Recommended Text
P.Duraipandian, Lakshmi Duraipandian and Muthamizh Jayapragasam [2006], **Mechanics,** S.Chand & co. New Delhi.

Reference Books
1. A.V.Dharmapadam, (1991) **Mechanics.** S. Vishwanathan Printers & Publishers. Chennai.

2. S.L.Loney, (1982) **Elements of Statics**, Macmillian.Delhi.

3. M.K.Venkataraman,(1990) **Statics**, Agastheir Book Depot,Trichy

4. P.N.Chatterji,(1996) **Statics** A.Rajhans Publications.[16 Edn], Meerut.

5. Joseph F.Shelly (2005) **Vector Mechanics for Engineers** Vol-1; Statics, Tata McGraw Hill Edition, New Delhi.

ELECTIVE -1

OPERATIONS RESEARCH – I

UNIT I
　　　　Linear Programming Problem – Mathematical formulation of the problem – Graphical solution method – Simplex method – Simplex Algorithm.
Chapter – 2 & 3 Sections 2.1 – 2.3, 3.1, 3.3

UNIT II
　　　　Artificial variable techniques – Big M method – Two phase method – Duality – Primal and dual relation - Dual simplex method.
Chapter – 3 & 4 Sections 3.5, 4.1 – 4.2, 4.5 – 4.6

UNIT-III
　　　　Integer programming – Gomory's All IPP method and Algorithm – Branch and Bound techniques.
Chapter – 11 Sections 11.1 – 11.4

UNIT-IV
　　　　Transportation problem – Mathematical formulation – The transportation table – Transportation Algorithm – Degeneracy in transportation problem – unbalanced transportation problem.
Chapter – 6 Sections 6.1 – 6.2, 6.9

UNIT-V
　　　　Assignment problem – Assignment Algorithm – Travelling Salesman problem.
Chapter – 7 Sections 7.1 – 7.5

Recommended Text
Kanti Swarup, Gupta P.K. and ManMohan [2006], **Operations Research**, Sultan Chand & Sons.Delhi.

Reference Books
1.　Taha H.A. (2003) **Operations Research,** Macmillan publishing Company, New York.
2.　R. Vital (2003) **Operations Research,** Margham publications, Chennai.
3.　J.K.Sharma, (2001) **Operations Research**: Theory and Applications, Macmillan, Delhi.
4.　S. J. Venkatesan, **Operations Research**, J.S Publications.

SKILL BASED – 3

MATHEMATICAL STATISTICS

UNIT –I
Basic terminology – Mathematical probability – Statistical probability – Axiomatic approach to probability – Conditional probability – Multiplication theorem of probability – Independent events.
Chapter - 3: Sections : 3.3,3.4,3.5,3.8,3.10,3.11,3.12.

UNIT –II :
Bayes theorem – Introduction – Distribution function – Discrete random variable – Continuous random variable.
Chapter - 4 & 5 : Sections 4.2, 5.1, 5.2, 5.3, 5.4(omit 5.4.2)

UNIT –III
Binomial Distribution : Moments, Mode, Moment generatic function - Poisson distribution : Moments, Mode, Moment generating function of the Poisson Distribution – Normal Distribution: Characteristics of the normal distribution – Mode, Median, Moment generating function of Normal Distribution.
Chapter - 8 & 9 : Sections 8.4.1, 8.4.5, 8.4.6, 8.5.2, 8.5.3, 8.5.5, 9 - 9.2.2, 9.2.3, 9.2.4, 9.2.5, 9.2.7

UNIT – IV
Assumptions underlying karl Pearson's correlation coefficient probable error of correlation coefficient - spearman's rank correlation coefficient , Tied (or) Repeated ranks, Repeated ranks.
Chapter – 10 : Sections   10.4.2, 10.6, 10.7.2, 10.7.2, 10.7.3

UNIT – V
Regression of X on Y and regression of Y on X.
Chapter – 11: Sections 11.1, 11.2

Recommended Text
S.C.Gupta, V.K.kapoor, **Mathemetical Statatics,** (2011) Sultan Chand and sons, New Delhi.

Reference Books

1. K.Murugesan, P.Guruswamy, **Probability, Statistics & Random processes**, Anuradha Agencies, Chennai.

2. S.C.Srivastava, Sangaya Srivastava, **Fundamentals of statistics**, Anmol Publications Pvt Limited, NewDelhi, 2003.

3. S.P.Gupta, **Mathematical Statistics.**

4. B.L.Agarwal, **Basic Statistics**, New Age International (P) Limited, Publications, Delhi, 2007.

PAPER - 11
LINEAR ALGEBRA

UNIT-I : Vector Spaces

Elementary Basic Concepts - Linear Independence and Bases.

Chapter – 4 Sections 4.1& 4.2.

UNIT-II : Vector Spaces

Dual spaces-Inner Product Spaces.

Chapter – 4 Sections 4.3 & 4.4.

UNIT-III : Linear Transformations

The Algebra of Linear transformations.
Chapter – 6 Sections 6.1.

UNIT-IV : Linear Transformations

Characteristic Roots – Matrices

Chapter – 6 Sections 6.2 & 6.3.

UNIT-V : Linear Transformations

Trace and Transpose(of matrices only) - Determinants.

Chapter – 6 Sections 6.8 (lemma 6.8.1, its corollary and lemma 6.8.5 only), 6.9.

Recommended Text
I.N.Herstein, **Topics in Algebra**-John Wiley & Sons.

Reference Books

1. S.Arumugam, (2004) **Modern Algebra**, Scitech Publications, Chennai.

2. J.B.Fraleigh(1987) , **A First course in Algebra** (3rd Edition) Addison Wesley, Mass.(Indian Print).

3. Lloyd R.Jaisingh and Frank Ayres, Jr.(2005) **Abstract Algebra,** (2nd Edition), Tata McGraw Hill Edition, New Delhi.

4. M.L.Santiago (2000) **Modern Algebra**, Tata McGraw Hill Edition, New Delhi.

   Surjeet Singh and QaziZameeruddin (1982) **Modern Algebra**. Vikas Publishing House Pvt.Ltd.New Delhi.

PAPER -12
REAL ANALYSIS - II

Unit – I : Continuous functions on metric spaces

Functions continuous on a metric space – Open sets – Closed sets.

Chapter 5 : Sections 5.3 – 5.5

Unit – II : Connectedness & Completeness

More about open sets – connected sets - Bounded sets and totally bounded sets – Complete metric spaces.

Chapter 6: Sections 6.1 – 6.4

Unit – III : Compactness

Compact metric spaces – Continuous functions on compact metric spaces – Uniform continuity.

Chapter – 6: Sections 6.5, 6.6, 6.8

Unit – IV : Calculus

Sets of measure zero – Definition of the Riemann integral – Existence of the Riemann integral – Properties of the Riemann integral – Derivatives.

Chapter – 7 : Sections 7.1 – 7.5

Unit – V : Calculus

Rolle's theorem – The law of the mean – Fundamental theorems of calculus – Taylor's theorem.

Chapter – 7 & 8 : Sections 7.6 – 7.8, 8.5

Recommended Text
R. Goldberg, **Methods of Real Analysis**-Oxford & IBH Pub.co.New Delhi.

Reference Book
Tom Appostal (1974) - **Mathematical Analysis** 2nd Edition.

PAPER -13
MECHANICS-II

UNIT-I

Kinematics of a particle – velocity – acceleration - relative velocity - relative acceleration - angular velocity - Acceleration components in coplanar motion along two fixed perpendicular directions - tangential and normal directions - radial and transverse directions - Simple problems.
Chapter – 1 : Sections 1.1 – 1.4

UNIT-II

Work - power – energy - principle of work and energy - rectilinear motion with uniform acceleration - simple Harmonic motion - simple problems.
Chapter – 11 & 12 : Sections 11.1 – 11.3, 12.1

UNIT-III

Motion of a projectile - nature of a trajectory - results pertaining to the motion of a projectile - range of a inclined plane - simple problems.
Chapter – 13 : Sections 13.1 – 13.2 (Omit 13.1.6)

UNIT-IV

Impulsive force – Newton's experimental law - direct and oblique impact of two smooth spheres - impact of smooth sphere on a fixed smooth plane - simple problems.
Chapter – 14 : Section 14.1 – 14.5

UNIT-V

Moment of inertia of simple bodies - theorems of parallel and perpendicular axis - moment of inertia of a triangular lamina and circular ring - right circular cone - sphere (solid and hollow) - simple problems.
Chapter – 17 : Section 17.1

Recommended Text

P.Duraipandian, lakshmiDuraipandian and Muthamizh Jayapragasam,(2006) **Mechanics,** Sixth revised edition, S.Chand & Co.New Delhi.

Reference Books

1. A.V.Dharmapadam, (1991) **Mechanics.** S.Vishwanathan Printers & Publishers. Chennai

2. S.L.Loney, (1982) **Elements of Statics**, Macmillian.Delhi.

3. M.K.Venkataraman, (1990) **Statics,** Agastheir Book Depot,Trichy

4. P.N.Chatterji, (1996) **Statics** A.Rajhans Publications. (16 Edn), Meerut.

5. Joseph F.Shelly (2005) **Vector Mechanics for Engineers** Vol-1; Statics, Tata McGraw Hill Edition, New Delhi.

ELECTIVE –2

OPERATION REASEARCH – II

UNIT- I

Game theory - Two persons zero sum game - The maxmini, minimax principle – Saddle points – Dominance property - Games without saddle points – Mixed strategies – Graphical solution of 2 x n and m x 2 games.
Chapter – 9 : Sections : 9.1 – 9.7

UNIT-II

Sequencing problem – n jobs through 2 machines, – n jobs through 3 machines, – 2 jobs through m machines, – n jobs through m machines.
Chapter – 10 : Sections : 10.1 - 10.5
.

UNIT-III

Queuing theory – Basic concepts – steady state analysis of M/M/1 and M/M/S systems with finite and infinite capacities.
Chapter – 17 : Sections : 17.1 – 17.8 (omit 17.8.2)

UNIT-IV

Inventory Models –EOQ Model - Uniform demand rate with finite and infinite production rate with shortages – Inventory control with price break.
Chapter – 18 : Sections : 18.1 – 18.7

UNIT-V

Network scheduling by CPM / PERT – Project Network Diagram –Critical path method (CPM) – PERT Computations.
Chapter – 21 : Sections : 21.1 – 21.9

Recommended Text

KantiSwarup, Gupta P.K. and Man Mohan (2006), **Operations Research,** Sultan Chand & Sons. Delhi.

Reference Books

1. Prof .V.Sundaresan and others, **Operations Research**, ARS Publications.

2. Taha H.A. (2003) **Operations Research,** Macmillan publishing Company, New York.

3. R.Vittal (2003) **Operations Research,** Margham publications, Chennai.

4. J.K.Sharma, (2001) **Operations Research:** Theory and Applications, Macmillan, Delhi.

5. S. J. Venkatesan, **Operations Research,** J.S Publications

ELECTIVE – 3

PROGRAMMING IN C LANGUAGE

UNIT-I

Constants – Variables - Data types – Declaration of variables.
Sections: 2.1-2.8

UNIT-II

Operators and Expressions.
Section: 3.1-3.8 & 3.14-3.15

UNIT-III

Managing Input and Output Operators – Decision Making and Branching.
Section: 4.1- 4.5 & 5.1-5.8

UNIT-IV

Decision Making and Looping – Arrays.
Section: 6.1-6.5 & 7.1-7.4

UNIT-V

User – Defined Functions – Structure & Unions.
Section: 9.1-9.13, 9.15, 9.16, 10.1-10.5, 10.8-10.12

Recommended Text

E.Balagurusamy, Contents and Treatment as in **'Programming in ANSI C'**

ELECTIVE – 3 PRACTICAL

PROGRAMMING IN C LANGUAGE

1. Calculate the average of a set of numbers.

2. Evaluate the roots of a quadratic equation.

3. Print the largest of the three numbers using nested if…else statement.

4. Calculate the range of given values.

5. Find the number of and sum of all integers greater than 100 and less than 200 that are divisible by 7.

6. Compute x to the power n using while loop.

7. Evaluate and print Binomial Coefficients.

8. Compute and print a table of factorials for any given m.

9. Calculate and print the first m Fibonacci numbers using a Do…while loop.

10. Sort a list of numbers by interchanging method

11. Find the Median of list of numbers.

12. Calculate the Standard Deviation of list of numbers.

13. Find the multiplication of two matrices.

14. Write a program that defines a structure and assign values to structure members.

15.   Find the two's compliment of a binary numbers.

SKILL BASED – 4

NUMERICAL METHODS

UNIT-I : Finite Differences

First and higher order differences - forward differences and backward differences - properties of operators - Differences of a polynomial - Factorial Polynomials - Operator E, Relation between Δ, ∇ and E.

UNIT-II : Interpolation with equal intervals

Newton - Gregory formula for forward & backward interpolation -Terms missing.

UNIT-III : Divided Differences

Relation between ordinary and divided difference - Newton's divided difference formula (unequal intervals) Lagrange's interpolation (for each equal and unequal intervals).

UNIT-IV : Central Differences

Central difference operators- Central difference formula: Gauss forward and backward formula-Sterling's formula - Bessel's formula.

UNIT-V : Inverse Interpolation

Lagrange's method, Reversion - Method of successive approximations based on Newton's forward and backward difference interpolation formula.

Recommended Text
S.Arumugham (2003) **Numerical Methods,** New Gamma Publishing, Palamkottai.

Reference Books
1. H.C.Saxena (1991) **Finite Differences and Numerical analysis** S.Chand &co., Delhi.

2. A.Singaravelu (2004) **Numerical Methods** Meenakshi Agency, Chennai.

3. P.Kandasamy, K.Thilagavathy (2003) **Calculus of Finite difference & Numerical Analysis,** S.chand&Company Ltd., New Delhi-55.

PAPER I - ALLIED MATEMATICS

(For Physics, Chemistry, and Computer Science)

UNIT - I

Exponential and logarithmic series (without Proof) - Summation and approximation - simple problems. Hyperbolic and inverse hyperbolic functions, Logarithm of Complex numbers.

UNIT -II

Polynomial equation with real co-efficients, irrational roots, symmetric functions of roots , transformation of equation - increasing or decreasing roots by a constant, reciprocal equations; Horner's method to find a root approximately - simple problems.

UNIT-III

Symmetric, Skew -Symmetric, Hermitian, orthogonal and unitary matrices, Eigen values and Eigen vectors, Cayley -Hamilton theorem (without proof) - Verification - Computation of inverse matrix.

UNIT-IV

Operators ∇, Δ, E, difference tables, Newton's forward and backward interpolation formulae, Lagrange's Interpolation Formula.

UNIT-V

n-th derivatives, Leibnitz theorem (without proof) and application, Jacobians, Maxima and minima of functions of two variables, Lagrange's multipliers -Simple problems.

Reference

1. P. Duraipandian and Dr. S. Udayabaskaran, Muhil Publishers, Allied Maths Volume 1 and 2

2. P.Balasubramanian and K. G. Subramanian, Ancillary Mathematics Volume 1 and 2

3. S. Narayanan and others, S. Viswanathan publichers. Ancillary Mathematics

4. Dr. P. R. Vittal (Margham Publishers), Allied Mathematics.

PAPER II - ALLIED MATEMATICS

(For Physics, Chemistry, and Computer Science)

UNIT - I

Bernoulli's formula for integration by parts, reduction formulae. Properties of definite integral and simple problems,

UNIT- II

Evaluation of double, triple integrals (only Cartesian coordinates), simple applications to area and volume.

Fourier series: Fourier series for function in $(0, 2\pi)$, $(-\pi, \pi)$

UNIT- III

Laplace transformations of standard functions and simple properties, inverse Laplace transforms.

UNIT- IV

Application of Laplace and Inverse Laplace Transform - Solving linear ordinary differential equation of order 1 and 2 with constant coefficients.

PDE - formation of PDE, complete integrals and general integrals, four standard types, Lagrange's equation.

UNIT-V

Scalar point functions, vector point functions, gradient, divergence, curl- directional derivatives, normal to a surface. Line and surface integrals, Gauss Divergence Theorem – Greens Theorem – Stoke's Theorem (all without Proof) - Simple problems.

Reference

1. P. Duraipandian and Dr. S. Udayabaskaran, Muhil Publishers, **Allied Maths Volume 1 and 2.**

2. P.Balasubramanian and K.G. Subramanian, **Ancillary Mathematics Volume 1 and 2.**

3. S. Narayanan and others, S. Viswanathan publichers. **Ancillary Mathematics.**

4. Dr. P. R. Vittal (Margham Publishers), **Allied Mathematics.**

5. Dipak Chaterjee, Tata McGraw Hill Publichers Co. Ltd., **Integral calculus and Differential equation.**

PAPER 1

ALGEBRA I

UNIT I

Homomorphisms – Another Counting Principle – Sylow's Theorem.

Chapter– 2 Sections 2.7 (Only Applications 1 & 2), 2.11, 2.12

UNIT II

Direct Products – Finite Abelian Groups.

Chapter -   2 Sections 2.13 & 2.14

UNIT III

Polynomial Rings – Polynomials over the Rational Field – Modules.

Chapters - 3 & 4   Sections 3.9, 3.10 & 4.5

UNIT IV

Extension Fields – Roots of Polynomials – More About Roots.

Chapter - 5 Sections 5.1, 5.3 & 5.5

UNIT V

Elements of Galois Theory - Solvability by radicals.

Chapter - 5 Sections 5.6, 5.7

TEXT BOOK

I.N.Herstein, **Topics in Algebra** (Second Edition) Vikas Publications, New Delhi.

Reference Book

1. John B. Fraliegh: **A First Course in Abstract Algebra,** Addition Wesley.

2. Hoffman and Kunze: **Linear Algebra**, Prentice Hall.

PAPER 2

REAL ANALYSIS I

UNIT-I: Functions of Bounded Variation

Introduction - Properties of monotonic functions - Functions of bounded variation- Total variation - Additive property of total variation - Total variation on [a, x] as a function of x - Functions of bounded variation expressed as the difference of two increasing functions - Continuous functions of bounded variation.

Chapter- 6 Sections 6.1 - 6.8

UNIT-II: The Riemann - Stieltjes Integral

Introduction - Notation - The definition of the Riemann - Stieltjes integral – Linear Properties - Integration by parts- Change of variable in a Riemann - Stieltjes integral - Reduction to a Riemann Integral - Step functions as a integrators – Reduction of a Riemann – Steiltjes integral to a finite sum - Euler's summation formula.

Chapter – 7 Sections 7.1 - 7.10

UNIT-III: The Riemann-Stieltjes Integral

Monotonically Increasing integrators, Upper and lower integrals - Additive and linearity properties of upper and lower integrals - Riemann's condition - Integrators of bounded variation-Sufficient conditions for the existence of Riemann- Stieltjes integrals- Necessary conditions for the existence of Riemann-Stieltjes Integrals- Mean value theorems for Riemann - Stieltjes integrals - The integrals as a function of the interval - Second fundamental theorem of integral calculus.

Chapter – 7 Sections 7.11 - 7.20

UNIT-IV : The Riemann-Stieltjes Integral

Change of variable in a Riemann integral-Second Mean Value theorem for Riemman Integrals – Riemman Stieltjes integrals depending on a parameter - Differentiation under the integral sign – Interchanging the order of integration.

Infinite Series And Infinite Products

Absolute and conditional convergence - Dirichlet's test and Abel's test - Rearrangement of series - Riemann's theorem on conditionally convergent series - Multiplication of series – Cesaro summability - Infinite products.

Chapters – 7 & 8 Sections 7.21 to 7.25, 8.8, 8.15, 8.17, 8.18, 8.24 - 8.26

UNIT-V: Sequences of Functions

Point wise convergence of sequences of functions - Examples of sequences of real - valued functions - Definition of uniform convergence - Uniform convergence and continuity - The Cauchy condition for uniform convergence - Uniform convergence of infinite series of functions - Uniform convergence and Riemann - Stieltjes integration - Uniform convergence and differentiation - Sufficient condition for uniform convergence of a series uniform convergence and double sequences - Mean convergence.

Chapter - 9 Sections 9.1 - 9.6, 9.8, 9.10, 9.11, 9.13

Recommended Text

Tom M. Apostol, **Mathematical Analysis,** 2nd Edition, Addison-Wesley Publishing, Company Inc. New York, 1974. (for unit I, II & III)

Reference Books

1. Bartle, R.G. **Real Analysis,** John Wiley and Sons Inc., 1976.

2. Rudio, W. **Principles of Mathematical Analysis,** McGraw 1979.

3. Malik,S.C. and Savita Arora. **Mathematical Analysis,** Wiley 1991.

4. Sanjay Arora and Bansi Lal, **Introduction to Real Analysis,** Prakashan, 1991.

PAPER 3

ORDINARY DIFFERENTIAL EQUATIONS

UNIT - I : Linear Differential Equations of Higher Order
Introduction – Higher order Equations – A modeling Problem – Linear Dependence – Equations with constant coefficients – Equation with variable coefficients.
Chapter – 2 Sections 2.1 – 2.6

UNIT - II : Linear Differential Equations of Higher Order
Wronskian – Variation of parameters – Some standard methods : Method of undetermined coefficients, Reduction of the order of equation.
Solution in Power Series : Solution in power series – Introduction – Second order linear equations with ordinary points.
Chapters - 2 & 3 Sections 2.7 – 2.9, 3.1 – 3.2

UNIT - III : Solution in Power Series
Legendre equation and Legendre polynomials, Laguerre polynomials – Second order equation with regular singular points – Properties of Bessel function.
Chapter – 3 Sections 3.3 – 3.4

UNIT – IV : System of Linear Differential equations
Introduction - System of first order equations – Existence and Uniqueness theorem – Fundamental Matrix - Non homogeneous linear systems – Linear systems with constant coefficients – Linear systems with periodic coefficients.
Chapter – 4 Sections 4.-1 – 4.2, 4.4 – 4.8

Unit - V : Existence and uniqueness of solutions
Introduction - Successive approximations - Picard's theorem – Some examples - Continuation and dependence on initial conditions - Existence of solution in the large – Existence and uniqueness of solutions of systems.
Chapter – 5 Sections 5.1, 5.3 – 5.8.

Recommended Text
S.G. Deo & V.Raghavendra, **Ordinary Differential Equations and Stability theory** by -Tata Mc Graw Hill publishing company Ltd.

Reference Books
1. M.D.Raisinghania, **Ordinary and partial differential equations,** Chand &Co. Ltd.

2. Sharma & Gupta, **Differential equations,** Krishna Prakashan Media (P) Ltd.,

3. William E.Boyce & Richard C.DiPrima, **Elementary Differential equations and boundary value Problem,** John Wiley & Sons, New York.

PAPER 4

MECHANICS I

Unit I

Galilean transformations. Maxwell's equations. The ether Theory. The principle of relativity. The Lorentz transformation equations. Events and simultaneity - example - Einstein's train. Time dilation. Longitudinal contraction. Example 7.3 & 7.4.

Donald T.Greenwood, Classical Dynamics : Chapter – 7 Sections 7.1, 7.2

Unit II

The invariant interval. Proper time and proper distance. The world line. Example – the train paradox. Addition of velocities. The relativistic Doppler effect – Example:-The Twin Paradox problem using Dopple Effect.

Donald T.Greenwood, Classical Dynamics : Chapter – 7 Section 7.2

Unit III

Momentum, Energy The momentum – energy four vectors force. Conservation of energy Mass and Energy Example – Inelastic collision. The principle of equivalence. Lagrangian and Hamiltonian formulations. Rocket with constant acceleration. Example:- 7.7 Rocket with constant thrust.

Donald T.Greenwood, Classical Dynamics : Chapter – 7 Sections 7.3, 7.4.

Unit IV

Physical laws. Spaces of N dimensions. Co-ordinate transformations. The summation convention. Covariant and covariant vectors. Contravariant and mixed tensors, The Kronecker delta. Tensors of rank greater than two. Scalars or invariants. Tensor fields. Symmetric and skew symmetric tensors. Fundamental Operation with tensors.

Schaum's outline series, Vector Analysis : Chapter – 8 Sections 8.1 – 8.7.

Unit V

The line element and metric tensor conjugate or reciprocal tensors. Associated tensors. Length of a vector. Angle between vectors. Physical components. Christoffel symbols. Transformation laws of christoffel symbols. Geodesics. Covariant derivatives. Permutation symbols and tensors. Tensor form of gradient, divergence and curl. The intrinsic (or) absolute derivatives, Relative and absolute tensors

Schaum's outline series, Vector Analysis : Chapter – 8 Sections 8.9 – 8.17.

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Recommended Text

1. Donald T.Greenwood, **Classical dynamics** – Prentice – Hall of India Pvt. Limited – New Delhi
2. Schaum's outline series, **Vector Analysis** - Metric Editions. Schaum's outline series – Murray R.Spiegel

Reference Books

1. Goldstein, **Classical Mechanics** (Addition Wesley)
2. N.E. Rana and P.S. Joag, **Classical Mechanics** (Tata McGraw Hills.)
3. U.C.De, Absos Ali Shaikh & Joydeep Sengupta, **Tensor Analysis,** Second Edition, Narosa Publishing House.

ELECTIVE
PAPER 1

A. PROBABILITY THEORY

UNIT - I: Random Events and Random Variables

Random events – Probability axioms – Combinatorial formulae – conditional probability – Bayes Theorem – Independent events.
Chapter - 1 Sections 1.1 - 1.7

UNIT - II: Random Events and Random Variables

Random Variables – Distribution Function – Joint Distribution – Marginal Distribution – Conditional Distribution – Independent random variables – Functions of random variables.
Chapter - 2 Sections 2.1 - 2.9

UNIT - III: Parameters of the Distribution

Expectation – Moments – The Chebyshev Inequality – Absolute moments – order parameters – Moments of random vectors – Regression of the first and second types.
Chapter – 3 Sections 3.1 - 3.8

UNIT - IV: Characteristic Functions

Properties of characteristic functions – Characteristic functions and moments – Semi-invariants – characteristic function of the sum of the independent random variables – Determination of distribution function by the characteristic function - Characteristic function of multidimensional random vectors – probability generating functions.
Chapter - 4 Sections 4.1 - 4.7

UNIT - V: Some Probability Distributions

One point, two point, Binomial – Polya – Hyper geometric – Poisson (discrete) distributions – uniform – Normal-gamma – Beta – Cauchy and Lap lace (continuous) distributions.
Chapter - 5 Sections 5.1 -5.10

Recommended Text
M. Fisz, **Probability Theory and Mathematical statistics,** John Wiley and Sons, New York, 1963.

Reference Books
1. R.B Ash, **Real Analysis and Probability,** Academic Press, New York,   1972.
2. K.L.Chung, **A Course in Probability,** Academic Press, New York, 1974.
3. R.Durrett, **Probability: Theory and Examples,** (2nd Edition) Duxbury Press,   New York, 1996.
4. V.K. Rohatgi **An introduction to Probability Theory and Mathematical statistics,** Wiley Eastern Ltd., New Delhi, 1988 (3rd Print).
5. S.L. Resnick, **A Probability Path**, Birharser, Berlin, 1999.
6. B.R.Bhat, **Modern Probability Theory** (3rd Edition), New Age International (P) Ltd, New Delhi, 1999.

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ELECTIVE
PAPER 1

B. INTEGRAL EQUATIONS

</div>

UNIT – I : Introduction

Definition – Regularity conditions – Special kinds of Kernals – Eigen values and Eigen functions – Convolution integral – The inner or scalar product of two functions.

Integral equations with separable Kernals

Reduction to a system of algebraic equations – Examples – Fredholm alternative – Examples.

Chapters – 1 & 2 Sections 1.1 – 1.6 & 2.1 – 2.4

UNIT – II : Methods of Successive Approximations

Iterative scheme – Examples – Volterra integral equations – Examples – Some results about the resolvent kernel.

Classical Fredholm Theory

The method of solution of Fredholm equation – Fredholm first theorem – Examples.

Chapters – 3 & 4 Sections 3.1 – 3.5 & 4.1 – 4.3

UNIT – III : Applications to Ordinary Differential Equations

Initial value problems – Boundary value problems – Examples – Direct Delta function – Green's function approach – Examples.

Chapter 3 Sections 5.1 – 5.6

UNIT – IV : Symmetric Kernels

Introduction – Fundamental properties of eigen values and eigen functions for symmetric kernels – Expansion in eigen functions and bilinear form – Hilbert – Schmidt theorem and some immediate consequences.

Chapter – 7 Sections 7.1 – 7.6

UNIT – V : Singular Integral Equations

The Abel Integral equations – Examples – Cauchy Principal value for integrals – Cauchy – type integrals.

Chapter – 8 Sections 8.1 – 8.4

Recommended Text

Ram P. Kanwal, **Linear Equations, Theory and Techniques,** Academic Press, New York, 1971.

Reference Books

1. M.D. Raisinghania, **Integral Equations and Boundary Value Problems,** S. Chand & Co., New Delhi, 2007.
2. Sudir K. Pundir and Rimple Pundir, **Integral Equations and Boundary Value Problems,** Pragati Prakasam, Meerut, 2005.
3. M. Rahman, **Integral Equations and their applications,** WIT Press, 2007.

PAPER 5

ALGEBRA II

UNIT-I: Linear transformations

Canonical forms : Triangular form **-** Nilpotent transformations.

Chapter – 6 Sections 6.4 - 6.5

UNIT- II: Linear transformations

Canonical forms : Jordan forms - Rational Canonical form - Trace and Transpose

Chapter – 6 Sections 6.6 - 6.8.

UNIT - III: Linear transformations

Hermitian, Unitary, and Normal transformations - Real quadratic forms.

Chapter – 6 Sections 6.10 - 6.11

UNIT - IV: Finite fields

Finite fields- Wedderburn's theorem on Finite Division Rings (excluding the second proof).

Chapter – 7 Sections 7.1-7.2.

UNIT - V: Finite fields

Theorem of Frobenius - Integral Quaternions and The Four Square Theorem

Chapter – 7 Sections 7.3 - 7.4.

Recommended Text

 I.N. Herstein, **Topics in Algebra** (Second Edition) Vikas Publications.

Reference Books

1. John B. Fraliegh, **A First course in Abstract Algebra,** Addison Wesley.

2. Hoffman and Kunze, **Linear Algebra,** Prentice Hall.

PAPER 6

REAL ANALYSIS II

Tom M. Apostol: **Mathematical Analysis** (for units I, II & III)

UNIT – I : Sequence of functions

Power series – Multiplication of power series – The substitution Theorem – Reciprocal of a Power series – The Taylor's Series generated by a function – Bernstein's Theorem – Abel's Limit Theorem – Tauber's Theorem.

Chapter – 9 Sections 9.14 – 9.17, 9.19, 9.20, 9.22, 9.23

UNIT - II: Multivariable Differential Calculus

Introduction - The Directional derivative - Directional derivative and continuity – The total derivative - The total derivative expressed in terms of partial derivatives – The matrix of linear function - The Jacobian matrix - The chain rule - Matrix form of chain rule - The mean - value theorem for differentiable functions - A sufficient condition for differentiability - A sufficient condition for equality of mixed partial derivatives - Taylor's theorem for functions of R_n to R_1

Chapter - 12 Sections 12.1-12.5, 12.7-12.14

UNIT - III: Implicit Functions and Extremum Problems

Functions with non-zero Jacobian determinants - The inverse function theorem – The Implicit function theorem - Extrema of real valued functions of severable variables - Extremum problems with side conditions.

Chapter - 13 Sections 13.1 to 13.7

G. De Barra, **Measure Theory and Integration** (for units IV & IV)

UNIT IV: Measure on the Real Line

Lebesgue Outer Measure – Measurable sets – Regularity – Measurable Functions – Borel and Lebesgue Measurability.

Chapter – 2 Sections 2.1 - 2.5

UNIT V: Integration of Functions of a Real Variable

Integration of Non- negative functions – The General Integral – Riemann and Lebesgue Integrals.

Chapter – 3 Sections 3.1, 3.2 and 3.4

Recommended Text
1. Tom M. Apostol: **Mathematical Analysis,** 2nd Edition, Addison - Wesley Publishing Company Inc. New York, 1974.
2. G. De Barra, **Measure Theory and Integration,** Wiley Eastern Ltd., New Delhi, 1981, (for Units IV and V)

Reference Books

1. Burkill, I.C. **The Lebesgue Integral,** Cambridge University Press, 1951).

2. Munroe, M.E. **Measure and Integration.** Addison – Wesley, Mass. 1971.

3. Roydon, H.L. **Real Analysis,** Macmillan Pub. Company, New York, 1988.

4. Rudin, W. **Principles of Mathematical Analysis,** McGraw Hill Company, New York, 1979.

5. Malik, S.C. and Savita Arora. **Mathematical Analysis,** Wiley Eastern Limited. New Delhi, 1991.

6. Sanjay Arora and Bansi Lal, **Introduction to Real Analysis**, Satya Prakashan, NewDelhi, 1991.

PAPER 7

OBJECT-ORIENTED PROGRAMMING WITH C++

UNIT I: Functions In C++

Introduction – The main Function – Functions Prototyping – Call by Reference – Return by Reference – Inline Functions – Default Arguments – Const Arguments – Recursion. Function Overloading – Fixed and Virtual Functions – Math Library Functions.
Chapter – 4 Sections 4.1 – 4.12

UNIT II: Classes and Objects

Introduction – C structures Revisited – Specifying a class – Defining Member Functions – A C++ program with class – Making an outside Function Inline – Nesting of Member Functions – Private Member Functions – Arrays within a class – Memory Allocation for objects – Static Data Members – Static Functions – Arrays of Objects – Objects as Functions Arguments – Friendly Functions – Returning objects – Const Member Functions – Pointers to Members – Local Classes.
Chapter – 5 Sections 5.1 – 5.19

UNIT III: Operator Overloading And Type Conversions

Introductions – Defining operator Overloading – Overloading unary Operators – Overloading Binary Operators – Overloading Binary Operators Using Friends – Manipulation of Strings using Operators – Some other Operator overloading Examples – Rules for Overloading Operators Type Conversions.
Chapter – 7 Sections 7.1 – 7.9

UNIT IV: Inheritance - Extending Classes

Introduction - Defining Derived Classes - Single Inheritance – Multiple inheritance – Virtual Base Classes – Abstract Classes – Constructors in Derived Classes – Member Classes: Nesting of Classes
Chapter – 8 Sections 8.1-8.12

UNIT – V : Pointers, Virtual Functions and Polymorphism

Introduction – Pointers – Pointers to Objects – This Pointer – Pointers to Derived Classes – Virtual Functions – Pure Virtual Functions – Virtual Constructors and Destructors.
Chapter – 9 Sections 9.1 to 9.8

Recommended Text

E. Balagurusamy, **Object Oriented Programming with C++,** Sixth Edition, Tata McGraw Hill Publishing Company Ltd., New Delhi, 2013.

Reference Books

1. D. Ravichandran, **Programming with C++,** Tata McGraw Hill 1996.

2. P. sundharasan, D. Harirama Krishnan, **Computer Programming in Fortan, C and** C++, First Edition, 1999. RBA Publication.

3. Jesse Liberty, Jim Keogh, **C++ An Introduction to Programming,** Prentice, Hall of India Private Limited, New Delhi., 2000. Seventh Edition.

4. Yashavant D. Kanetkar, **Let us C++,** BPB Pub First Edition, 1999. **OOP in C++** SAMS.

PAPER 8

OBJECT-ORIENTED PROGRAMMING WITH C++ : PRACTICAL

1. Display the Fibonacci Sequence upto n terms.

2. Finding nc_r and np_r values.

3. Finding Sum, Average, Standard Deviation and Variance of n numbers.

4. Processing a Shopping list.

5. Adding two vectors using objects as function arguments.

6. Display the conjugate and modulus of a complex number.

7. Overloading operators using friend function.

8. Program for overloading constructors.

9. Program for constructing as m x n matrix.

10. Single Inheritance.

11. Multilevel Inheritance.

12. Hybrid Inheritance.

13. Pointers to derived objects.

14. Program for this pointer.

15. Runtime polymorphism.

Recommended Text

E. Balagurusamy, **Object Oriented Programming with C++,** Sixth Edition, Tata McGraw Hill Publishing Company Ltd., New Delhi, 2013.

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ELECTIVE
PAPER 2

A. MATHEMATICAL STATISTICS

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UNIT – I : Sampling Moments And Their Functions

Notion of a sample and a static – Distribution functions of X, S2 and (X, S2) - $\chi 2$ Distribution – Student t – Distribution – fisher's Z – Distribution – Snedecor's F – Distribution – Distribution of a sample mean from non-normal populations.
Chapter - 9 Sections 9.1 - 9.8

UNIT – II : Significance Test

Concept of a statistical test – parametric tests for small samples and large samples test – Kolmogrov Theorem 10.11.1. – Smirnov Theorem 10.12.2. – Tests of Kolmogorov Independence Tests by contingency tables.
Chapter – 10 & 12 Sections 10.11 , 12.1 -12.7

UNIT – III : Estimation

Preliminary notion – Consistency estimated – unbiased estimates – Sufficiency – Efficiency – Asymptotically most efficient estimates – methods of finding estimates – Confidence Interval.
Chapter - 13 Sections 13.1 - 13.8

UNIT – IV : Analysis of Variance

One way classification and two-way classification. Hypotheses Testing : Poser functions – OC function – Most powerful test – Uniformly most powerful test – Unbiased test.
Chapter – 15 & 16 Sections 15.1 - 15.2, 16.1 - 16.5

UNIT – V : Sequential Analysis

SPRT – Auxiliary theorem Wald's fundamental identity – OC function and SPRT – E(n) and Determination of A and B-Testing a hypothesis concerning p 0-1 distribution and m in Normal distribution.
Chapter - 17 Sections 17.1 - 17.9

Recommended Text
M. Fisz, **Probability theory and Mathematical Statistics,** John Wiley and sons, New York 1963.

ELECTIVE
PAPER 2

B. ADVANCED OPERATIONS RESEARCH

UNIT I: Linear Programming - Revised Simplex Method

Mathematical Formulation – Standard LP Model in Matrix form – Basic solutions and bases – The Simplex Tableau in Matrix form – Revised Simplex Method – Product form of the Inverse – Steps of the Primal Revised Simplex Method.
Duality Analysis
Definition of the dual problem – solution of the dual problem – Relationship between primal and dual objective values – optimal dual solution
Section 4.1, 4.2, & 5.1, 5.2

UNIT II: Inventory Model

The ABC Inventory System – A Generalized inventory model; Deterministic Models – Single-item static model (EOQ) – Single-item static model with price breaks – Multiple-item static model with storage limitation – N. Policy production scheduling model – Single-item N-period dynamic EOQ Model.
Section 14.1, 14.2 & 14.3

UNIT III: Queuing Models

Basic elements of the queueing model – role of the Poisson and exponential distributions – Pure birth and Pure Death Processes – Generalized Poisson Model – Steady state measures of performance - Single server and Multiserver Poisson queues with finite and infinite capacity
Section 15.1 – 15.5 (omit 15.5.5 & 15.5.6)

UNIT IV: Non linear Programming: Classical optimization Theory

Unconstrained Extremal Problems – Necessary and sufficient conditions for extrema-The Newton's Raphson Method: constrained extremal problems -Equality constraints – Inequality constraints.
Section: 19.1, 19.2.

UNIT V: Nonlinear Programming Algorithms

Unconstrained nonlinear Algorithms - Direct search method - Gradient method; constrained nonlinear Algorithms -Separable programming -Quadratic Programming - Geometric Programming.
Section 20.1 & 20.2 (omit 20.2.4, 20.2.5, 20.2.6).

Recommended Text

Hamdy A. Taha, **Operations Research: An Introduction** (Fifth Edition) Macmillan Publishing Company, New York, 1991.

Reference Books

1) A.Ravindran, Don T. Phillips and James J.Solberg: **Operations Research Principles and practice** 2-e, Wiley & Sons, New York, 2004.
2) Frederick S. Hillier and Gerald J.Lieberman, **Operations Research**, 7-e, Tata McGraw Hill Publishing Company Ltd., New Delhi, 2001.
3) S.D.Sharma, **Operations Research**, 15-e, Kedarnath Ram Nath & Co. Publishers.

COMPULSORY PAPER

HUMAN RIGHTS

UNIT I

Definition of Human Rights-Nature, Content, Legitimacy and priority Theories on Human Rights- Historical Development.

UNIT II

International Human Rights –Prescription and Enforcement up to World War II-Human Rights and the U.N.O-Universal Declaration of Human Rights-International Covenant on Civil and Political Rights-International covenant on Economic, Social and Cultural Rights and Optional Protocol.

UNIT III

Human Rights Declarations-U.N. Human Rights Declarations-U.N. Human Commissioner.

UNIT IV

Amnesty International- Human Rights and Helsinki Process-Regional Developments-European Human Rights System-African Human Rights System-International Human Rights in Domestic Courts.

UNIT V

Contemporary Issues on Human Rights: Children's Rights-Women's Rights-Dalit's Rights-Bonded Labour and Wages-Refugees-Capital Punishments. Fundamental Rights in the Indian Constitution-Directive Principles of State Policy-Fundamental Duties-National Human Rights Commission.

Reference Books
1. International bill of Human Rights, Amnesty InterPub.1998.
2. Human Rights, Questions and Answers, UNESCO, 1982.
3. Mausice Cranston   -What is Human Rights.
4. Desai.A.R-Violation of Democratic Rights in India.
5. Pandey-Constitutional Law.
6. Timm.R.W.Working for Justice and Human Rights.
7. Human Rights, a Selected Bibliography, USIS.
8. J.C.Johari - Human Rights and New World Order.
9. G.S.Bajwa - Human Rights in India.
10. Amnesty International, Human Rights in India.
11. P.C.Sinha & K.Cheous -Social Justice and Human Rights[vol.1-7]
12. Devasia, V.V. - Human Rights and Victimology.

Magazines
1. The lawyer, Bombay.
2. Human Rights Today, Columbia University.
3. International Instruments of Human Rights, UN Publication.
4. Human Rights Quarterly, John Hopkins University, U.S.A

PAPER 9

COMPLEX ANALYSIS I

UNIT-I: Functions as Mappings
   Conformality -Linear Transformation
   Chapter - 3 Sections 2.1-2.4, 3.1-3.5

UNIT-II: Complex Integration
   Fundamental Theorem Cauchy's Integral Formula
   Chapter - 4 Sections 1.1-1.5, 2.1-2.3

UNIT-III: Complex Integration
   Local properties of analytical functions- The General of Cauchy's theorem
   Chapter - 4 Sections 3.1-3.4, 4.1-4.5

UNIT-IV: Complex Integration
   The calculus of Residues- Harmonic functions
   Chapter - 4 Sections 5.1-5.3, 6.1-6.5

UNIT-V: Series and product Developments
   Power Series Expansion- Partial fractions and factorization
   Chapter - 5 Sections 1.1-1.3, 2.1-2.4

Recommended Text
   L.V.Ahlfors: **Complex Analysis,** (Third Edition), Mc- Graw Hill.

PAPER 10

TOPOLOGY

UNIT – I
　　Topological spaces –Basis for a Topology – The Order Topology – The Product Topology on X x Y – The Subspace Topology.
Chapter – 2 Sections 12 – 16

UNIT – II
　　Closed Sets and Limit points – Continuous Functions.
Chapter – 2 Sections 17 – 18

UNIT – III
　　The Product Topology – Connected Spaces – Connected Subspaces of the Real Line.
Chapter – 2 & 3 Sections 19, 23, 24

UNIT – IV
　　Compact Spaces – Compact Subspaces for the Real Line – Limit Point Compactness.
Chapter – 3 Sections 26 – 28

UNIT – V
　　The Separation Axioms – Normal Spaces – Urysohn Lemma – The Tietze Extension Theorem.
Chapter – 4 Sections 31 – 33, 35

Recommended Text
James R. Munkres, **Topology,** Second Edition, Published by Pearson India Education Services Pvt. Ltd.

Reference Book
George F.Simmons, **Topology and Modern Analysis,** McGraw - Hill Book Company.

PAPER 11

PARTIAL DIFFERENTIAL EQUATIONS

UNIT - I: Partial Differential Equations of First Order

Formation and solution of PDE- Integral surfaces - Cauchy Problem order equation -Orthogonal surfaces - First order non-linear - Characteristics - Compatible system -Charpits method.
Chapter – 0 Sections 0.4 - 0.11 (omit 0.11.1)

UNIT - II: Fundamentals

Introduction - Classification of Second order PDE - Canonical forms- Adjoint operators-Riemans method.Introduction - Classification of Second Order PDE - Canonical forms - Adjoin Operators - Riemann's method.
Chapter – 1Sections 1.1 - 1.5

UNIT - III: Elliptic Differential Equations

Derivation of Lap lace and Poisson equation - BVP - Separation of Variables - Dirichlet's Problem and Newmann Problem for a rectangle - Solution of Laplace equation in Cylindrical and spherical coordinates - Examples.
Chapter – 2 Sections 2.1, 2 2, 2.5 - 2.7, 2.10 - 2.13

UNIT - IV: Parabolic Differential Equations

Formation and solution of Diffusion equation - Dirac- Delta function - Separation of Variables method - Solution of Diffusion Equation in Cylindrical and spherical Coordinates - Examples.
Chapter – 3 Sections 3.1 - 3.7 and 3.9

UNIT - V: Hyperbolic Differential Equations

Formation and solution of one-dimensional wave equation - canocical reduction - IVPd'Alembert's Solution - IVP and BVP for two-dimensional wave equation - Periodic solution of one-dimensional wave equation in cylindrical and spherical coordinate systems - Uniqueness of the solution for the wave equation - Duhamel's Principle - Examples.
Chapter – 4 Sections 4.1 – 4.4, 4.7 – 4.9, 4.11

Recommended Text
K. SankarRao, **Introduction to Partial Differential Equations**, 2nd Edition, Prentice Hall of India, New Delhi. 2005.

Reference Books
1. R.C.McOwen, **Partial Differential Equations,** 2nd Edn. Pearson Eduction, New Delhi, 2005.
2. I.N.Sneddon, **Elements of Partial Differential Equations**, McGraw Hill, New Delhi, 1983.
3. R.Dennemeyer, **Introduction to Partial Differential Equations and Boundary Value Problems,** McGraw Hill, New York, 1968.
4. M.D.Raisinghania, **Advanced Differential Equations,** S.Chand & Company Ltd.

PAPER 12

MECHANICS II

UNIT I : Introductory Concepts

The Mechanical System – Generalized Coordinates – Constraints – Virtual Work - Energy and momentum

Chapter – 1 Section 1.5

UNIT II : Lagrange's Equation

Derivation of Lagrange's – Examples.

Chapter – 2 Sections 2.1, 2.2

UNIT III : Integrals of Motion

Integrals of motion

Chapter – 2 Section 2.3

UNIT IV : Hamilton's Equation

Hamilton principle - Hamilton's equations- Other Variational Principles.

Chapter – 4 Section 4.1 – 4.3

UNIT – V : Canonical Transformation

Differential Forms and Generating Functions – Special Transformations – Lagrange and Poisson Brackets.

Chapter – 6 Sections 6.1 – 6.3

Recommended Text

Donald T. Greenwood, **Classical Dynamics** Prentice- Hall of India Private Ltd (1985)

ELECTIVE
PAPER 3

A. FUZZY SETS

Unit – I :From Classical (CRISP) Sets to Fuzzy Sets
Crisp sets : An overview – Fuzzy Sets : Basic Types – Fuzzy Sets : Basic Concepts.

Chapter - 1 Sections 1.2 – 1.4

Fuzzy Sets Versus Crisp Sets
Additional Properties of α-Cuts – Representations of Fuzzy Sets – Extension Principle for Fuzzy Sets.

Chapter – 2 Sections 2.1 – 2.3

Unit – II : Operations on Fuzzy Set
Types of Operations – Fuzzy Complements.

Chapter – 3 Sections 3.1 – 3.2

Unit – III : Operations on Fuzzy Set
Fuzzy Intersections: t-Norms - Fuzzy Unions : t-Conorms.

Chapter – 3 Sections 3.3, 3.4

Unit – IV : Fuzzy Arithmetic
Fuzzy Numbers – Linguistic Variables – Arithmetic Operations on Intervals - Arithmetic Operations on Fuzzy Numbers – Lattice of Fuzzy Numbers.

Chapter – 4 Sections 4.1 – 4.5

Unit – V : Fuzzy Relations
Crisp versus Fuzzy Relations – Projections and Cylindric Extensions – Binary Fuzzy Relations – Binary Relations on a single set – Fuzzy Equivalence relations.

Chapter – 5 Sections 5.1 – 5.5.

Recommended Text
George J. Klir and Bo Yuan, **Fuzzy sets and Fuzzy Logic – Theory and Applications,** Prentice Hall India, New Delhi, 2001.

Reference Books
A. Kaufman, **Introduction to the theory of Fuzzy subsets**, Vol. I, Academic Press, New York, 1975.

ELECTIVE
PAPER 3
B. FLUID DYNAMICS

UNIT – I

Kinematics of Fluids in motion: Real fluids and ideal fluids – Velocity of a fluid at a point, stream lines, path lines, steady and unsteady flows – velocity potential – The vorticity vector – Local and particle rates of changes – Equations of continuity – Worked examples – Acceleration of a fluid – Conditions at a rigid boundary.

Chapter – 2 Sections 2.1 – 2.10

UNIT – II : Equations of Motion of a Fluid

Pressure at a point in a fluid at rest. Pressure at a point in a moving fluid – Conditions at a boundary of two inviscid immiscible fluids – Euler's equation of motion – Discussion of the case of steady motion under conservative body forces.

Chapter – 3 Sections 3.1 – 3.7

UNIT – III

Some three dimensional flows. Introduction – Sources, Sinks and Doublets – Images in a rigid infinite plane – Axis symmetric flows – Stokes stream function.

Chapter – 4 Sections 4.1 – 4.3, 4.5

UNIT – IV : Some Two Dimensional Flows

Meaning of two dimensional flow – Use of cylindrical polar coordinate – The stream function – The complex potential for two dimensional, irrational incompressible flow – Complex velocity potentials for standard two dimensional flows – Some worked examples – Two dimensional image systems – The Milne Thompson circle Theorem.

Chapter – 5 Sections 5.1 – 5.8

UNIT – V : Viscous Flows

Stress components in a real fluid – Relations between Cartesian components of stress – Translational motion of fluid elements – The rate of strain quadric and principle stresses – Some further properties of the rate of strain quadric – Stress analysis in fluid

motion – Relation between stress and rate of strain – The coefficient of viscosity and Laminar flow – The Navier – Stokes equations of motion of a viscous fluid.

Chapter – 8 Sections 8.1 – 8.9

Recommended Text

F. Chorlton, Text Book of **Fluid Dynamics**, CBS Publications. Delhi, 1985.

Reference Books

1. R.W. Fox and A.T. Mc Donlad. **Introduction to Fluid Mechanics,** Wiley, 1985.

2. E. Krause, **Fluid Mechanics with Problems and Solutions,** Springer, 2005.

3. B.S. Massey, J.W. Smith and A.J.W. Smith, **Mechanics of Fluids,** Taylor and Francis, New York, 2005.

4. P. Orlandi, **Fluid Flow Phenomena,** Kluwer, New York, 2002.

5. T. Pet rila, Basics of **Fluid Mechanics and Introduction to Computational Fluid Dynamics,** Springer, Berlin, 2004.

PAPER 13

COMPLEX ANALYSIS II

Unit- I: Series and product Developments
Entire functions- The Riemann Zeta function – Product Development – Extension of Zeta function to the whole plane – The zeros of zeta function.
Chapter – 5 Sections 3.1-3.2, 4.1-4.4

Unit- II: Series and product Developments
Normal families – Equicontinuity – Normality and compactness – Arzela's theorem – Families of analytic functions – The classical definitions.
Chapter - 5 Sections 5.1-5.5

UNIT-III: Conformal Mapping
Riemann Mapping Theorem - Conformal mapping and Dirchlet problem (only) - Harmonic functions – Functions with mean value property – Harnack's Principle.
Chapter - 6 Sections 1.1, 1.2, 3.1-3.2

UNIT-IV:Elliptic Functions
 Simply Periodic functions- Doubly periodic functions
Chapter – 7 Sections 1.1-1.3, 2.1-2.4

UNIT-V: Elliptic Functions
The Weierstrass Theory – The Weierstrass P-function – The differential equation – The Modular equation.
Chapter - 7 Sections 3.1-3.4

Recommended Text
L.V.Ahlfors: **Complex Analysis,** (Third Edition), Mc- Graw Hill.

PAPER 14

FUNCTIONAL ANALYSIS

UNIT-I: Banach Spaces

The definition and some examples – Continuous linear transformation - The Hahn Banach Theorem.

Chapter – 9 Sections 46-48

UNIT-II: Banach Spaces

The Natural imbedding of N in N**- Open mapping theorem- The conjugate of an operator.

Chapter – 9 Sections 49 - 51

UNIT-III: Hilbert Spaces

The definition and some simple properties - Orthogonal complements - Ortho Normal Sets.

Chapter – 10 Sections 52 - 54

UNIT-IV: Hilbert Spaces

The conjugate Space H*- The adjoint of an Operator - Self adjoint operators- Normal and unitary operators - Projections.

Chapter – 10 Sections 55 – 59

UNIT-V : Finite Dimensional Spectral Theory

Matrices – Determinants and the spectrum of the operators – The spectral theorem.

Chapter – 11 Sections 60 - 62

Recommended Text

George F.Simmons, **Topology and Modern Analysis** - McGraw- Hill Book Company.

PAPER 15

NUMERICAL ANALYSIS

UNIT – I

Bisection Method – Regula-Falsi Method (Method of False position) – Iteration Method or Fixed Point Iteration – Newton-Raphson Method or Method of Tangent - Newton-Raphson Method for Multiple Root – Modification on Newton-Raphson Method – Modified Newton-Raphson Method – Secant Method.

Chapter - 4 Sections 4.2 – 4.4, 4.6 – 4.10.

UNIT – II

Chebyshev Method – Muller Method – Roots of Polynomial Equations – Birge-Vieta Method – Bairstow Method – Graeffe's Root Squaring Method – Solution of Systems of Nonlinear.

Chapter - 4 Sections 4.11 – 4.17.

Unit – III

Inverse of a Matrix – Matrix Inverse Method – Gauss Elimination Method – Gauss-Jordan Elimination Method – Method of Matrix Factorization – Gauss Elimination Method to Find Inverse of a Matrix – Cholesky Method.

Chapter – 5 Sections 5.3 – 5.9.

Unit – IV

Matrix Partition Method – Solution of Tri-diagonal System – Evaluation of Tri-diagonal Determinant – Vector and Matrix Norms – Ill-Conditional Linear Systems – Generalized Inverse (g-inverse) – Least Squares Solution for Inconsistent Systems – Jacobi's Iteration Method – Gauss-Seidal's Iteration Method.

Chapter – 5 Sections 5.10 – 5.18.

Unit – V

Newton-Cotes integration Formulae (Closed Type) - Newton-Cotes integration Formulae (Open Type) – Gaussian Quadrature – Gauss-Legender Integration Methods Gauss-Chebyshev Integration Methods –Gauss-Hermite Integration Methods – Gauss-Laguerre Integration Methods – Gauss-Jacobi Integration Methods.

Chapter – 7 Sections 7.13 –7.15 (omit 7.15.2 & 7.15.3).

Recommended Text

Madhumangal Pal, **Numerical Analysis For Scientists and Engineers, Theory and C Programs,** Pub. N.K. Mehra for Narosa Publishing House Pvt. Ltd., New Delhi.

Reference Books

1. Devi Prasad, **An Introduction to Numerical Analysis** (3rd Edn.) Narosa Publishing House, New Delhi, 2006.

2. D.Ravichandran, **Programming with C++,** Tata Mc Graw Hill 1996.

3. Conte and de Boor, **Numerical Analysis,** McGraw Hill 1990.

4. John H.Matews, **Numerical methods of Math., Sci. &Eng** (2nd Edn.) 2000.

5. E.Balagurusamy, Numerical Methods.

PAPER 16

NUMERICAL ANALYSIS : PRACTICAL

1. Program to find a root of the equation by Bisection method.

2. Program to find a root of the equation by Regula-Falsi method. Assume that a root lies between X0 and X1.

3. Program to find a root of the equation by Newton Raphson method.

4. Program to find a root of the equation polynomial equation by Birge-Vieta Method.

5. Program to find all the roots of a polynomial equation by Bairstow method.

6. Program to find a root of a pair of non-linear equations by Seidal method.

7. Program to find the inverse of a square matrix

8. Program to find solution of the system of linear equation by Gauss Elimination method.

9. Program for solution of a system of equation by LU decomposition method.

10. Program to solve a tri-diagonal system of equation.

11. Program for solution of a system of linear equation by Gauss-Jacobi's Iteration Method.

12. Program for solution of a system of linear equation by Gauss-Seidal'sMethod.

13. Program to find the integration of a function by 6-point Gauss-Legendre method.

Recommended Text
Madhumangal Pal, Numerical Analysis For Scientists and Engineers, Theory and C Programs, Pub. N.K. Mehra for Narosa Publishing House Pvt. Ltd., New Delhi.

ELECTIVE
PAPER 4

A. GRAPH THEORY

UNIT-I: Graphs, Subgraphs and Trees

Graphs and simple graphs - Graph Isomorphism - The Incidence and Adjacency Matrices - Sub graphs - Vertex Degrees - Paths and Connection - Cycles - Trees - Cut edges and Bonds - Cut Vertices.

Chapters – 1 & 2 Sections 1.1 - 1.7, 2.1 - 2.3

UNIT-II: Connectivity, Euler Tours and Hamilton Cycles

Connectivity - Blocks - Euler tours - Hamilton Cycles.

Chapters – 3 & 4 Sections 3.1 - 3.2, 4.1 - 4.2

UNIT-III: Matchings, Edge Colourings

Matching - Matching and Coverings in Bipartite Graphs - Edge Chromatic Number -Vizing's Theorem.

Chapters – 5 & 6 Sections 5.1 - 5.2, 6.1 - 6.2

UNIT-IV: Independent Sets and Cliques, Vertex Colourings

Independent sets - Ramsey's Theorem - Chromatic Number - Brooks' Theorem - Chromatic Polynomials.

Chapters - 7 & 8 Sections 7.1 – 7.2, 8.1 – 8.2, 8.4

UNIT-V: Planar Graphs

Plane and planar Graphs - Dual graphs - Euler's Formula - The Five-Colour Theorem and the Four-Colour Conjecture.

Chapter - 9 Sections 9.1 - 9.3, 9.6

Recommended Text

J.A.Bondy and U.S.R. Murthy, **Graph Theory and Applications,** Macmillan, London, 1976.

Reference Books

1. J.Clark and D.A.Holton, **A First look at Graph Theory,** Allied Publishers, New Delhi, 1995.
2. R. Gould. **Graph Theory,** Benjamin/Cummings, Menlo Park, 1989.Gibbons, **Algorithmic Graph Theory,** Cambridge University Press, Cambridge, 1989.
3. R.J.Wilson and J.J.Watkins, **Graphs: An Introductory Approach,** John Wiley and Sons, New York, 1989.
4. R.J. Wilson, **Introduction to Graph Theory,** Pearson Education, 4th Edition, 2004, Indian Print.
5. S.A.Choudum, **A First Course in Graph Theory,** MacMillan India Ltd.

ELECTIVE
PAPER 4

B. STOCHASTIC PROCESS

UNIT – I : Stochastic Processes

Specification of stochastic process – Stationary processes – Markov Chains : Definitions and Examples – Higher transition probabilities – Generalization of independent Bernoulli trials.
Chapter – 2 & 3 Sections 2.1 – 2.4, 3.1

UNIT – II : Markov Chains

Stability of Markov system – Graph theoretic approach – Markov chain with denumerable number of state – Reducible chains – Statistical inference for Markov chains. Pecification of stochastic processes – stationary processes – Markov Chains : Definitions and Examples – Higher transition probabilities – Generalization of independent Bernoulli trials.
Chapter – 3 Sections 3.6 – 3.10

UNIT – III : Markov Process with discrete state space

Poisson process : Poisson process and related distributions – Generalizations of poisson process – Birth and death process – Markov process with discrete state space (continuous time Markov chain).
Chapter – 4 Sections 4.1 – 4.5

UNIT – IV : Markov Process with continuous state space

Brownian motion – Weiner process – Differential equations for Weiner process – Kolmogorov equations – First passage time distribution for Weiner process.
Chapter – 5 Sections 5.1 – 5.5

UNIT – V : Renewal Process and Theory

Renewal process and renewal equation – Stopping time – Wald's equation – Renewal theorem – Delayed and equilibrium renewal process.
Chapter – 6 Sections 6.1 – 6.6

Recommended Text

J. Medhi, **Stochastic Processes** (2nd Edition), New Age International, 1992.

Reference Books

1. S. Karlin, **A first course in Stochastic Processes**, (2nd Edition), Academic Press, 1958.

2. U.N. Bhat, **Elements of Applied Stochastic Processes,** John Wiley Sons, 1972.

3. E. Cinlar, **Introduction to Stochastic Processes,** PHI, 1975.

4. S.K. Srinivasan and A, Vijayakumar, **Stochastic Processes,** Narosa, 2003.

Part – I
Core Course – I

ALGEBRA AND ANALYSIS
17MMS1

Unit – I : Rings , Ideals and Modules

Rings and ring homomorphism – Ideals – Quotient rings – Zero divisors – Nilpotent elements – Units Prime ideals and Maximal Ideals – Nil radical and Jocobson radical – operations on ideals – Extension and contraction – Exercises – Modules and module homomorphism – Submodules and Quotient modules – Operations on submodules – Direct sum and Product –Finitely generated modules – Exact sequences – Tensors product of modules – Restriction and Extension of scalars – Exactness properties of the tensor product Algebras – Tensor product of algebras – Exercises.

Unit – II : Rings, Modules Of Fractions and Primary Decomposition

Local Properties – Extended and contracted ideals in rings of fractions – Exercises – Primary decomposition – Exercises.

Unit – III : Chain Conditions, Noetherian Rings And Artin Rings

Chain conditions – Exercises – Primary decomposition in Noetherian rings – Exercises – Artin Rings – Exercises

Unit – IV : Abstract Intergration and L^p Spaces

The concept of measurability - simple functions – Elementary Problems – Intergration of positive functions – integration of complex function by set of measure zero – convex functions and inequalities – L^p Spaces .

Unit – V : Fouries Transformations and Holomorphic Fourier Transforms

Formal properties – The Invention theorem –The Plancheral algebra L^p Introduction – Two theorems of paley and Wie classes – The Denjoy – Carleman Theorem.

Text Books

1. M.F. Atiyah, I.G. Maodonald, **Introduction to Commutative Algebra**, Publishing Company, 1969.
   Unit – I Chapter – 1 (PP 1-10), Chapter – 2 (PP 17-31)
   Unit – II Chapter – 3 (PP 36-43), Chapter – 4 (PP 50 -55)
   Unit – III Chapter – 6 (PP 74 – 78), Chapter – 7 (PP 80 – 84, 89 – 91).

2. Walter Rudin, **Real and Complex Analysis**, 3rd Edition, McGraw Hill Pubs.
   Unit -4 Chapter -1 (PP 5 – 31), Chapter – 3.
   Unit – 5 Chapter – 9 (pp 178 – 193), Chapter – 19.

Part- I
Core Course – II

TOPOLOGY AND DIFFERENTIAL EQUATIONS
17MMS2

Unit – I: Fundamental Group and Covering Spaces
Homotopy – Fundamental Group – Covering Spaces.

Unit – II: Simplicial Complexes
Geometry of Simplicial Complexes – Bary Cenric Subdivitions – Simplicial Approximation Therom Fundamental Group of a Simplicial Complex.

Unit – III : Linear Systems
Uncoupled Linear System – Diagonalization – Exponentionals operators – The Fundamental Theorem for linear system – Linear system in R^2 - Complex Eigen Values – Multiple Eigen Values – Non Homogeneous Linear System.

Unit – IV : Non Linear Systems : Local Theory
Some preliminary Concepts and definitions – The Fundamental Existence – Uniqueness Theorem – Dependence on Initial Conditions and Parameters – The Maximum Interval of Existence – The Flow Defined by a Differential Equation.

Unit – V : Non Linear Systems
Linearization – The Stable Manifold Theorem – Dynamical Systems and Global Existence Theorems – Limit Sets and Attractors.

Text Books
1. I.M.Singer, J.A.Thorpe , **Lecture Notes on Elementary Topology and Geometry,** Springer – Verlag , New York, 1967.
   Unit- I :   Chapter -3 (pp49 -77)
   Unit –II : Chapter -4 (pp78 – 108)
2. L.Perko , **Differential Equation and Dynamical System,** Third Edition, Springer- Verlag New York, 2006.
   Unit – III Chapter -1 (Section1.1 to 1.7 and 1.10) (PP 1-39, 60-63)
   Unit – IV Chapter-2 (Section 2.1 to 2.5) (PP 65-101)
   Unit – V Chapter -3 (Section 3.1 and 3.2) (PP 181 – 199)

Part-I
Optional Paper: 1

HYDRODYNAMIC STABILITY
17MEMS

Introduction

Introduction – Mechanism of instability – Fundamental concepts of hydrodynamic – Kelvin-Helmholtz instability.

Sections: 1 -4

II: Thermal instability

Introduction – The equations of motion – The instability problem – general stability characteristics – particular stability characteristics.

Section: 6 – 10

III: Centrifugal instability

Introduction – Instability of an inviscid fluid – Instability of Couette flow of an inviscid fluid –
The Taylor problem.

Section: 14 – 17

Unit IV: Parallel shear flows

Introduction – The inviscid theory: The governing equations – General criteria for instability – The
viscous theory: The governing equations – Sufficient conditions for stability.

Sections: 20 – 22, 25, 26.2

Unit V: Additional topics in linear stability theory

Instability of parallel flow of a stratified fluid – Baroclinic instability.

Sections: 44 - 45

Text Book

P.G.Drazin & W.H. Reid, **Hydrodynamic Stability**, Cambridge University Press (2004).

M.Phil., Mathematics : Syllabus (CBCS)

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Part-I

Optional Paper: **2**

FUZZY TOPOLOGY

17MEMS

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Unit – I: Fuzzy Topological Space

Fuzzy Sets – Concepts of a fuzzy point and its neighbourhood structure – Fuzzy points and levels sets – Local base – A couter example – closure and kuratowski's theorem on 14 sets – Accumulation points : Generalization of C.T. Yang's Theorem - Ω Accumulation points : Lindeloop Property – Subspaces.

Chapter – 1 : Sections 1.1 – 1.8

Unit – II : Fuzzy Product Induced Spaces

Fuzzy Product Spaces - The Functions ω and τ - Fuzzy continuity – Product induced spaces.

Chapter – 2 : Sections 2.1 – 2.4

Unit – III : Fuzzy Compact Spaces

Quasi Fuzzy compact spaces – Weakly Fuzzy compact spaces – a-compact spaces – Strong fuzzy compact spaces – Ultra – Fuzzy compact spaces.

Chapter – 5 : Sections 5.1 – 5.6

Unit – IV :Initial and Final Fuzzy Topologies

Initial Fuzzy topologies – Final Fuzzy topologies – A comparison of different compactness notions in fuzzy topologies spaces – Good Extensions – Product Theorems – Implications.

Chapter – 6 : Sections 6.1 – 6.6

Unit – V : Connectedness in Fuzzy Topological Spaces

Fuzzy Connectedness – An alternative characterization of $l(\delta)$ – The Product Theorem for (c1) and (c2).

Chapter – 7 : Sections 7.1 – 7.3

Text Book

N. Palaniappan, **Fuzzy Topology** (Second Edition) – Narosa Publishing House.

Reference :

S. Nanda and N.R. Das, **The Fuzzy mathematical concepts** – Narosa Publishing House.S.

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Part-I
Optional Paper: 3

FLUID DYNAMICS
17MEMS

I : Kinematics of Fluids in Motion

Real Fluids and Ideal Fluids – Velocity of a Fluid at a point – Streamlines and ... – Steady and Unsteady Flows – The Velocity Potential – The Vorticity Vector – ... and particle roots of change – The Equations of continuity .

... 2 : Sections 2.1 – 2.7

II : Equations of motion of a Fluid

Pressure at a point in a fluid at rest – Pressure at a point in a moving fluid – ...ditions at a boundary of two inviscid immiscible fluids – Euler's equations of motion – ...rnouill's Equation.

...apter – 3 : Sections 3.1 – 3.5

Unit – III : Some two dimensional flows

Meaning of two dimensional flow – Use of Cylindrical polar Coordinates – The Stream Function – The Complex Potential for Two –Dimensional, Irrotational, Incompressible flow – The Milne – Thomson Circle Theorem – The Theorem of Blasius – The Schwarz – Christoffel Transformation.

Chapter – 5 : Sections 5.1 – 5.4 , 5.8, 5.9, 5.11.

Unit – IV Elements of Thermodynamics

The equation of State of a substance – The First Law of Thermodynamics – The second Law of Thermodynamics.

Gas Dynamics

Compressibility Effects in Real Fluids – The Elements of wave Motion.

Chapter – 6 & 7 : Sections 6.1, 6.2, 6.10, 7.1 , 7.2

Unit – V : Viscous Flow

Stress Components in a real Fluid – Relations between Stress and Rate of strain – The coefficient of viscosity and Laminar Flow – The Navier – Stoke's Equations of motion of a Viscous fluid – some solvable problems in viscous flow – steady flow in pipes – Flow through a pipe – The Hagen Poiseuille Flow – Prandtl's Boundary layer.

Chapter – 8 : Sections 8.1, 8.7 – 8.10, 8.16

Text Books

Text Book of **Fluid Dynamics** by Frank Chorlton, CBS publishers & Distributors, Delhi.

Reference Books

1. L.M. Milne Thomson, **Theoretical Hydrodynamics**, Macmillan Company.
2. N. Curle and H.J. Davies, D. Yan Nonstrand, **Modern Fluid Dynamics** – Volume – I by Company limited, London.
3. S.W. Yuan, **Foundations of Fluid Mechanics** by Prentice Hall.

Part-I
Optional Paper: 4

SYMMETRIES OF DIFFERENTIAL EQUATIONS

17MEMS

Unit – I : Non-Linear Differential Equations

Analysis of Method of Non-linear Equations – Existence theorem – Extremal solutions – Upper and lower solutions – Monotone Iterative Method – Bihari Inequality – Variation of Parameters.

Unit – II : Boundary Value Problems

Boundary value problems – Introduction – Sturm-Liouville problem – Green's function – Application of Boundary value problems – Picard's Theorem – Oscillation of second order equations – Fundamental results – Sturms comparison Theorem – Elementary linear oscillation – Comparison theorem of Hille – Wintner.

Unit – III : Stability

Stability of linear and non-linear system – Elementary critical points – System of Equations with constant coefficients – Linear Equation with constant coefficients – Lyapunov stability – Stability of Quasi – Linear System – Second order linear coefficient equations.

Unit – IV : Lie Group

Lie groups of transformations and infinitesimal Transformations : Lie Groups of transformations - Infinitesimal Transformations.

Unit – V

Extended transformations (Prolongations) multi – parameter lie groups of transformations – Lie Algebras.

Text Book

1. S.G. Deo, V. Lakshmikantham and V. Ragavendra, **Text Book of Ordinary Differential Equations,** Tata McGraw Hill Publications Co. New Delhi 1997.
Unit – I, II, III : Chapters : 6 – 9

2. G.W. Bluman and S. Kumei, **Text Book of Symmetries and Differential Equations,** Applied Mathematics Sciences Volume. 81, Springer –Verlag, New York, 2002.
Unit – IV, V : Chapters : 2.1 – 2.4

Reference Books

1. W. Coppel, **Stability and Asymptotic Behavior of Differential Health Boston,** 1965.
2. P. Bailey, L. Shampine and Waltman, **Nonlinear. Two Points Boundary Value Problems,** Academic Press, New York, 1968.
3. P.J. Oliver, **Application of Lie Groups to Differential Equations,** 2nd Edition, Springer-Verlag, New York, 1993.

Part-I
Optional Paper: 5

GENERAL TOPOLOGY
17MEMS

With the knowledge of topological spaces and continuous functions, the ... is as follows.

Unit-I: Connectedness and Compactness
Connected Spaces–Connected Subspaces of the Real Line – Components and Local Connectedness – Compact Spaces – Compact Subspaces of the Real Line – Limit Point Compactness – Local Compactness.
Chapter 3:Sec:23 to 29

Unit–II: Countability and Separation Axioms
The Countability Axioms–The Separation Axioms–Normal Spaces–The Urysohn Lemma –The Urysohn Metrization Theorem–The Tietze Extension Theorem–Imbeddings of Manifolds.
Chapter 4 : Sec: 30 to 36

Unit–III:Metrization Theorems and Paracompactness
Local Finiteness – The Nagata-Smirnov Metrization Theorem – Paracompactness – The Smirnov Metrization Theorem.
Chapter 6 : Sec : 39 to 42

Unit–IV: Complete Metric Spaces and Function Spaces
Complete metric spaces – A space-Filling Curve – Compactness in metric Spaces – Pointwise and Compact Convergence – Ascoli's Theorem.
Chapter 7 : Sec : 43 to 47

Unit–V:Baire Spaces and Dimension Theory
Baire Spaces – A Nowhere-Differentiable Functions.
Introduction to Dimension Theory.
Chapter 8 : Sec : 48 to 50

Text Book
James R.Munkres, **Topology**,Eastern Economy Edition Second Edition, Delhi, 2013.

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Part-I

Optional Paper: 6

QUEUEING THEORY

17MEMS

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Unit – I

Introduction – Description of the Queueing problem – Characteristics of Queueing Processes – Notations – Measuring System performance – Some general results – Poisson process and the Exponential distribution – Markovian property of the Exponential distribution – Stochastic process and Markov chains – Steady state Birth – Death processes – Problems – Steady state solution for the M/M/1 model - Methods of solving steady state difference equations.

Unit – II

Queues with parallel channels (M/M/c), Queues with parallel channels and truncation (M/M/c/K) – Formula (M/M/c/c) – Queues with unlimited service (M/M/) – Finite source Erlang's Queues – State – Dependent Service.

Unit – III

Queues with Impatience – Transient Behavior – Busy –Period Analysis for M/M/1 and M/M/c – Problems – Bulk input ($M^{[x]}$/M/1) – Bulk Service (M/$M^{[y]}$/1)

Unit – IV

Erlangian Models (M/E_k/1, E_k/M/1, E_j/E_k/1) – Priority Queue Disciplines – Problems – Series Queues.

Unit – V

Single – Server queues with poisson input and general service (M/G/1) – Multi server queues with poisson input and general service – General input and exponential service – Problems.

Text Book

Donald Grass and Carl M. Harris – Fundamentals of Queueing Theory (3rd edition) John Wiley & Sons (Asia) Pvt. Ltd.

References

1. Cohen, J. W. (1982), **The single Server Queue** 2nd Edition. New York , North Halland.
2. Cooper R.B. (1981) **Introduction to Queueing theory** 2nd Edition. New York , North Halland.

Part-I
Optional Paper: 7

FUZZY ALGEBRA

17MEMS

Unit - I

Union of two Fuzzy subgroups- Fuzzy subgroup generated by a Fuzzy subset- Fuzzy normal subgroups- Fuzzy normal subgroups- Fuzzy conjugate subgroups and Fuzzy characteristic subgroups.
Section 2.1 to 2.5

Unit – II

Some elementary properties- Union of Fuzzy subrings (Fuzzy ideals)- Fuzzy subring (Fuzzy ideals) generated by a Fuzzy subset – Fuzzy subset – Fuzzy ideals and homomorphism- Fuzzy cosets.
Section 3.1 to 3.5

Unit - III:

Fuzzy prime ideals – Fuzzy maximal ideals-Fuzzy semiprime ideals – Characterization of regularity
Section 4.1 to 4.4

Unit - IV

Fuzzy primary ideals- Fuzzy primary ideals- Fuzzy semi-primary ideals-Fuzzy irreducible ideals of rings
Section 5.1,5.2& 6.1

Unit - V

Fuzzy irreducible ideals in Notherian rings - Definitions and Some properties – Fuzzy Prime spectrum of a Boolean Ring – Irreducibility and Connectedness
Section 6.2, 7.1to7.3

Text Book

Rajesh Kumar, 'Fuzzy Algebra" –Vol - I, University of Delhi Publication Division, 1993.

Reference

W.B.Vasantha Kandasamy, "SmarandacheFuzzy Algebra" – American Research Press, 2003.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS)
VELLORE – 632 002

DEPARTMENT OF PHYSICS

CBCS - B.Sc. Physics
Major and Allied Syllabus for I to VI Semester

MARCH-2017

UG DEGREE COURSE CBCS PATTERN – B.Sc., PHYSICS THE COURSE OF STUDY AND SCHEME OF EXAMATIONS

Year/ Sem	Part	Subject	Paper	Title of the Paper	Ins. Hrs/ Week	Credit	Exams Hrs	Max. Marks		
								IA (25)	Ext (75)	Total (100)
I Year/ I Sem	I	Language	I	Tamil I	6	3	3	25	75	100
	II	English	I	English I	6	3	3	25	75	100
	III	Core	I	Heat & Thermodynamics	5	4	3	25	75	100
	III	Core	I	Main Practical I	4	-	-	-	-	-
	III	Allied I	I	Mathematics I	7	5	3	25	75	100
	IV			Environmental studies	2	2	3	25	75	100
Total					**30**	**17**				
I Year/ II Sem	I	Language	II	Tamil II	6	3	3	25	75	100
	II	English	II	English II	6	3	3	25	75	100
	III	Core	II	Properties of Matter & Acoustics	5	4	3	25	75	100
	III	Core	I	Main Practical I	4	4	3	40	60	100
	III	Allied I	II	Mathematics II	7	5	3	25	75	100
	IV			Value Education (General Awareness)	2	2	3	25	75	100
Total					**30**	**21**				

Year/ Sem	Part	Subject	Paper	Title of the Paper	Ins. Hrs/ Week	Credit	Exams Hrs	Max. Marks		
								IA (25)	Ext (75)	Total (100)
II Year/ III Sem	I	Language	III	Tamil III	6	3	3	25	75	100
	II	English	III	English III	6	3	3	25	75	100
	III	Core	III	Classical Mechanics & Mathematical Methods	4	4	3	25	75	100
	III	Core	II	Main Practical II	2	-	-	-	-	-
	III	Allied II	III	Allied Chemistry I	7	4	3	25	75	100
				Allied Practical		-	-	-	-	-
	IV	Skilled Based Subject I		Electrical appliances	3	3	3	25	75	100
		Non Major Elective I		Renewable energy sources	2	2	3	25	75	100
		Total			**30**	**19**				
II Year/ IV Sem	I	Language	IV	Tamil IV	6	3	3	25	75	100
	II	English	IV	English IV	6	3	3	25	75	100
	III	Core	II	Nature of Light	4	4	3	25	75	100
	III	Core	II	Main Practical II	3	4	3	40	60	100
	III	Allied II	IV	Allied Chemistry II	7	4	3	25	75	100
			I	Allied Chemistry Practical I		2	3	25	75	100
	IV	Skilled Based Subject II		Electronic appliances	2	3	3	25	75	100
		Non Major Elective II		Electric and Electronic appliances	2	2	3	25	75	100
		Total			**30**	**25**				

Year/ Sem	Part	Subject	Paper	Title of the Paper	Ins. Hrs/ Week	Credit	Exams Hrs	Max. Marks		
								IA (25)	Ext (75)	Total (100)
III Year/ V Sem	III	Core	V	Electricity & Magnetism	5	5	3	25	75	100
	III	Core	VI	Atomic Physics & Spectroscopy	5	5	3	25	75	100
	III	Core	VII	**Solid State Physics & Material Science**	5	5	3	25	75	100
	III	Core	III	Main Practical III	6	-	-	-	-	-
	III	Core	IV	Electronics Practical IV		-	-	-	-	-
		Elective I	E1	Special Electronics I	6	5	3	25	75	100
	IV	Skilled Based Subject III		The Application of Physics in Day-Today life	3	3	3	10	40	50
	Total				**30**	**23**				
III Year/ VI Sem	III	Core	VIII	Nuclear & Particle Physics	5	5	3	25	75	100
	III	Core	IX	Relativity & Quantum Mechanics	5	5	3	25	75	100
	III	Elective	II	Special Electronics II	5	5	3	25	75	100
	III	Elective	III	Microprocessor and its applications 8085	6	5	3	25	75	100
	III	Core	III	Main Practical III	6	6	3	40	60	100
	III		VI	Advanced Electronics Practical IV		5	3	40	60	100
	IV	Skill Based Subject IV		Digital Technology	3	3	3	10	40	50
	IV	Extension Activity				1			50	50
	Total				**30**	**35**				
GRAND TOTAL					**180**	**140**				**3650**

Paper 1

HEAT AND THERMODYNAMICS

Semester I   Sub Code: 17U1PH 1
Hours/week: 5
Credit: 4
Max Marks: 75

Unit-I:
Thermometry & Calorimetry: Scales of temperature and relation between them – different types of thermometers - specific heat capacity of liquid and its determination using Newton's law of cooling - ideal gas equation – Specific heat capacities of gas - C_p and C_v - Mayer's relation between the two specific heats – Van der Waal's equation – critical constants – values of critical constants from Vander Waal's constants – thermostat – thermister.

Unit-II:
Transmission of heat: Conduction: Thermal conduction – rectilinear flow of heat along a bar – Forbe's method – thermal conductivity of a poor conductor – Lee's disc method – relation between thermal and electrical conductivities of metals – practical applications of conduction of heat.
Radiation: Black body radiation – distribution of energy in black body radiation – Wien's law and Rayleigh Jeans law – Planck's quantum theory of radiation - Stefan-Boltzmann law.

Unit-III:
Low temperature Physics: Joule-Thomson effect – porous plug experiment – liquefaction of gases – Linde's process – adiabatic demagnetization – Liquid Helium I and II – some peculiar properties of Helium II- lambda point and super fluidity – application of super fluidity in satellites – super conductivity – Types of superconductors, Meissner effect.

Unit-IV:
Laws of Thermodynamics: Zeroth law of thermodynamics – first law of thermodynamics – work done in an isothermal and in an adiabatic process – slope of isothermal and adiabatic – isobaric and isochoric process – second law of thermodynamics – Carnot's engine - Carnot's theorem - entropy – change in entropy in reversible and irreversible process – petrol and diesel engines and *T-S* diagram – third law of thermodynamics.

Unit-V:
Applications of thermodynamics: First latent heat equation (Clausius – Claperyon equation) and its application to effect of change of pressure on the boiling point and the melting point – second latent heat equation (Clausius equation) – Maxwell's thermodynamic relations – deduction of specific heat relation – Clausius-Claperyon latent heat equation – Helmholtz function – thermodynamic potential or Gibb's function – enthalpy.

Books for study:
1. Heat and thermodynamics – Brijlal and Subramaniam.
2. Heat and thermodynamics – D. S. Mathur.
3. Thermodynamics and statistical physics – Sharma and Sarkar.

Books for reference:
1. Heat and thermodynamics – J. B. Rajam and C.L. Arora. ,
2. The Feynmann lectures on Physics Vol. 1, Vol.2 and Vol.3 – R.P. Feynmann, R. B. Leighton and M Sands
3. Thermal Physics – A. B. Gupta and H. Roy

Paper 2
PROPERTIES OF MATTER AND ACOUSTICS

Semester II   Sub Code:17U2PH2
Hours/week: 5
Credit: 4
Max Marks: 75

PROPERTIES OF MATTER

Unit I:

Elasticity: Three types of elastic moduli – Relation between elastic moduli – Poisson's Ratio – Searle's static torsion method - Torsional pendulum – determination of rigidity modulus of the material of the wire (with masses) - Bending of beams – expression for internal bending – moment in terms of curvature of a neutral axis –uniform and non-uniform bending – Koenig's method – cantilever –oscillations of cantilever – I-form girders - Principle of Atomic Force Microscope.

Unit II:

Viscosity: Stream line and turbulent flow – velocity gradient and viscous force - co-efficient of viscosity – critical velocity - Poiseuilles' formula – correction formula – determination of co-efficient of viscosity by capillary flow method – comparison of viscosities by Oswald's bulb – motion in a highly viscous medium – Searle's viscometer – viscosity of gases-Rankin's method – lubrication.

Unit III:

Surface Tension: Molecular theory of surface tension – surface energy – angle of contact and its determination – excess of pressure in a curved surface – formation of drops – capillarity – theory and experiment interfacial surface tension – drop weight and Quincke's method of determination of surface tension – Variation of surface tension with temperature – variation of surface tension with vapour pressure.

ACOUSTICS

Unit IV :

Waves and Oscillations: Free, damped, forced vibrations and resonance – Fourier's theorem – application to   saw- tooth wave and square wave – intensity and loudness of Sound – Decibels – Intensity levels-Microphones and loud speaker – characteristics of sound . Doppler effect – Red and blue shift.

Unit V :

Ultrasonics: Production of Ultrasonic waves – piezoelectric crystal method – magnetostriction method – properties – Application to Science, industry and medicine.Acoustical grating-determination of velocity of ultrasonics in liquids-

Acoustics of buildings: Reverberation and time of reverberation – absorption co-efficient – Sabine's formula – measurement of reverberation time – acoustic aspects of hall and auditorium.

Book for Study:

1. Properties of matter - Murugeshan R., S.Chand &Co Pvt Ltd, New Delhi 1994.
2. Properties of matter - by Brij lal & Subramaniam N, Eurasis publishing Co, New Delhi, 1989.
3. Text book of sound - by Brij lal & subramaniam N, Vikas publishing House New Delhi, 1982.

Books for Reference:

1. Elements of properties of matter - Mathur D.S., Shymlal charitable Trust, New Delhi, 1993.
2. Text book of sound - Khanna D.R. & Bedi R.S., Atma Ram & Sons, New Delhi,1985.
3. The Feynman Lectures on physics, Vols.1, 2 and 3, - R.P.Feynman, R B Leighton and M Sands, Narosa, New Delhi, 1998

ALLIED PHYSICS-I

Semester I   Sub Code: 17UAPH 1
                                                                    Hours/week: 5
                                                                    Credit: 4
                                                                    Max. Marks: 75

Unit-I**:**
Mechanics: Impulse (derivation) – impulsive force – laws of impact – direct and oblique impacts between two smooth spheres – loss of kinetic energy due to direct and oblique impact between two smooth spheres – centripetal and centrifugal forces - motion of a cyclist along curved path – expression for normal acceleration – Bernoulli's theorem – Venturimeter – Toricelli's theorem.

Unit-II:
Properties of Matter:
Elasticity: Young's modulus – bending of beams – Young's modulus by non-uniform bending - theory and experiment – energy stored in a wire – torsion in a wire – theory of torsional oscillation – torsional pendulum – determination of rigidity modulus of material of the wire (without mass) – rigidity modulus of material of the steel rod by static torsion method.
Surface tension: Molecular theory of surface tension – formation of drops and bubbles – excess of pressure inside a soap bubble – surface tension by Jaguer's method and its correction.

Unit-III:
Heat and Thermodynamics: Kinetic theory of gases – specific heats of gas - definitions – Mayer's relation – Van der Waal's equation of state – derivation of critical constants – low temperature – Joule-Kelvin effect – liquefaction of gases – Linde's process – adiabatic demagnetization – laws of thermodynamics – entropy – reversible and irreversible processes – change of entropy in reversible and irreversible processes.

Unit-IV:
 Sound:
Progressive waves – characteristics – free, damped and forced oscillations – expression for velocity of sound in a string - specific gravity of solid by Melde's string method – velocity of sound in a rod – Kundt's tube – Doppler effect – reverberation – time of reverberation– absorption and reflection coefficients - Sabine's formula.

Unit-V:
Optics: Theory of interference – air wedge – Newton's rings – Fresnel's theory of rectilinear propagation of light - theory of grating – normal incidence – determination of wavelengths of mercury spectrum – polarization – double refraction – Nicol prism – polarizer and analyzer – optical activity – specific rotatory power – Laurentz half-shade polarimeter

Books for study:

1. Allied Physics – R. Sabesan and R. Dhanalakshmi.
2. Allied Physics – Kamalakannan and Jayaraman.
3. Allied Physics – K. Thangaraj.
4. Allied Physics – R. Ranganathan.

Books for reference:

1. Mechanics – D. S. Mathur.
2. Dynamics – M. Narayaranmurti and N. Nagarathnam.
3. Properties of matter – Brijlal and Subramaniam
4. Heat and Thermodynamics – Brijlal and Subramaniam
5. Optics and Spectroscopy – Brijlal and Subramaniam.
6. Sound - M. Narayaranmurthy
7. Sound – Brijlal and Subramaniam

ALLIED PHYSICS – 2

Semester II

<div align="right">SubjectCode: 17U2APH2
Hours/week: 4
Credit: 4
Max marks: 75</div>

Unit – I
Electricity and magnetism: Faraday laws of electromagnetic induction – self-induction and mutual induction – electro motive force – Lenz's law - LCR series resonance circuit – growth of current in a LCR circuit with steady emf – production and distribution of three phase A.C – star and delta connection - Dia, para and ferro magnetic materials – properties-– Langevin,s theory of Diamagetisation-Curie temperature.

Unit – II
Atomic physics: Positive rays – analysis – Bainbridge mass spectrograph – excitation and ionization potentials – Frank and Hertz experiment – Vector atom model – Pauli's exclusion principle – selection rules – X-rays - diffraction of X-rays – Bragg's law – Bragg spectrometer - Miller indices.

Unit – III
Nuclear physics: Nuclear models – liquid drop model – shell model – Magic numbers – radio activity – nature of alpha, beta and gamma rays – exponential law – half-life period – mean-life period – neutrons and thermal neutron - fission and fusion – nuclear reactor – fast breeder reactor – cosmic rays – introduction and classification of elementary particles – baryons – hadrons – leptons.

Unit – IV
Electronics:
Basic Electronics: Junction Diode – LED – Zener diode – voltage regulator – Junction transistor – Characteristics of Transistor – common base – common emitter mode

Digital electronics : AND, OR and NOT gates – construction using diodes and Transistors - Universal building blocks– NAND and NOR gates- Boolean algebra – Demorgan's theorem : verification – Elementary ideas of ICs – SSI, MSI, LSI and VLSI.

Unit – V
Communication: Radio communication – types of electro magnetic wave propagation: ground wave, sky wave and space wave (satellite) communication – Definitions: AM, FM and PM modulation – expression for the frequency modulated wave - merits and demerits of FM – RADAR: principle – range equation – applications – block diagram of digital communication .

Books for study:

1. Allied Physics – R. Sabesan and R. Dhanalakshmi.
2. Allied Physics – Kamalakannan and Jayaraman.
3. Allied Physics – K. Thangaraj.
4. Allied Physics – R. Ranganathan

Books for reference:

Electricity and Magnetism - Brijlal and Subramaniam.
Electricity and Magnetism – Dhughel and Chobra
Modern Physics – J. B. Rajam
Modern Physics – R. Murgesan
Principles of Electronics – V. K. Mehtha
Electronic communication system – George Kennedy

ALLIED PHYSICS PRACTICAL – I
(Any fifteen Experiments)

Semester I & II   Sub. Code 17UPHAPR1
Hours/week: 3
Credit: 2
Max marks: 75

1. Vernier calipers and Screw gauge measurements[*].

2. Vernier microscope and Spectrometer measurements[*].

3. Determination of Young's modulus – non-uniform bending - pin and microscope.

4. Determination of rigidity modulus and moment of inertia (with out mass) – Torsional pendulum.

5. Determination of rigidity modulus – Static torsion- scale and telescope.

6. Determination of surface tension of liquid and interfacial surface tension – Drop weight method.

7. Determination of AC frequency – Sonometer – Steel wire.

8. Determination of thickness of the wire – Air wedge method.

9. Determination of wavelengths of colours of Mercury spectrum – Grating – Spectrometer.

10. Determination of focal length of the given convex lens and the refractive index of the material of the lens

11. Determination of specific resistance of the coil – Meter bridge.

12. Calibration of low range voltmeter – Potentiometer.

13. Figure of merit – Table galvanometer.

14. Determination of m and B_H – Tan A position.

15. Determination of B_H – Field along the axis of a circular coil carrying current.

16. Zener diode as a voltage regulator.

17. Construction of fundamental logic gates AND, OR and NOT using diodes and transistor.

Note: 1. Practical examination at the end of the even semester.

1. A text book of Practical physics – M.N. Srinivasan, Balasubramaniam and R. Ranganathan
2. Practical Physics for B.Sc., - Arul Thalapathi

Paper 3

CLASSICAL MECHANICS AND MATHEMATICAL METHODS

Semester III

Sub Code: 17U3PH3
Hours/week: 4
Credit: 4
Max Marks: 75

CLASSICAL MECHANICS

Unit – I
Survey of the Elementary Principles: Mechanics of a particle and system of particles-Conservation theorems for energy and momenta – constraints – Generalized coordinates – transformation equations – Principle of virtual work - Lagrange's equation from D'Alembert's principle–Lagrange's equations for systems containing dissipative forces – Applications of Lagrange's equations–Linear Harmonic oscillator, simple pendulum and compound pendulum.

Unit – II
Hamilton's equation and their applications: Phase space – Hamiltonian function – Hamilton's canonical equations–Physical significance of Hamiltonian function – Applications of Hamiltonian equations: Motion of a particle in central force field and Linear harmonic oscillator.

MATHEMATICAL METHODS

Unit – III
Vector Analysis: Vector identities - Gradient of scalar field – Line, Surface and volume integrals – Divergence and curl of vector function and their physical significance – vector identities – Gauss divergence theorem – Stokes theorem.

Unit – IV

Matrices: Matrices and its types – transpose and inverse of matrix - Characteristic equation of matrix –Cayley-Hamilton theorem – Eigen values and Eigen vectors– theorems on Eigen values and Eigen vectors – Diagonalization of matrices.

Unit – V
Special functions: Definitions and evaluation of Beta and Gamma functions – symmetry properties of Beta and Gamma functions - relation between Beta and Gamma functions - Series solutions for Bessel and Legendre equations.

Books for study:
1. Classical Mechanics – Gupta, Kumar and Sharma, Pragati Prakashan.
2. Classical Mechanics – B.D. Gupta & Sathyaprakash, Kedar Nath Ram Nath
3. Mechanics and mathematical methods – R. Murugeshan, S.Chand and company Ltd.
4. Vector analysis – Murray T. Spiegel; Schaum outline series in Mathematics.
5. Mathematical Physics – Sathyaprakash, Sultan Chand and Sons.

Books for References:
1. Classical Mechanics – H. Goldstein, 2nd edn. Narosa Publishing house.
2. Matrices and Tensors – A. W. Joshi, 2nd edn. Wiley eastern limited.
3. Mathematical Physics – B.D. Gupta, Vikas publishing house Pvt. Ltd.
4. Advanced Engineering Mathematics – Erwin Kreyszig, 5th edn. Wiley Eastern limited
5. Higher Mathematics for engineering and science – DR. M.K. Venkataraman, The national publishing co.
6. Engineering Mathematics Vol. I to V – DR. M.K. Venkataraman, The national publishing co.

SKILL BASED SUBJECT I

ELECTRICAL APPLIANCES

Semester III   Sub Code: 17U3PHSB
Hours/week: 3
Credit: 3
Max Marks: 75

Unit I
Electrical charge – current – potential – Resistance – capacitance – inductance – units and identification of L,C, and R - Ohm's law - transformers – step-up, step-down transformers and their applications.

Unit II
Principle and uses of Galvanometer, ammeter, voltmeter and multimeter – Electrical energy – power – Watt – consumption of electrical power.

Unit III
AC and DC currents – single phase and three phase connections – star and delta connection - House wiring – importance of neutral - colour code for insulation wires - over loading – earthing – short circuiting - fuses — circuit breaker – electrical switches – street lighting.

Unit IV
Elementary ideas of inverters and UPS - Electrical bulbs – fluorescent lamps – CFL lamps – comparison of power consumptions with conventional lamps - flood lighting.

Unit V
Electric fans – wet grinder – mixer – water heater - iron box – microwave oven – stabilizers (Principle and working ideas only)

Books for study:
1. A text book of electrical technology – B.L. Theraja
2. A text book of electrical technology – A. K. Theraja.
3. Performance and design of AC machines – M. G. Say, ELSBS edn.

RENEWABLE ENERGY SOURCES

Semester III   Sub Code: 17U3PHNM
                                                                             Hours/week: 2
                                                                             Credit: 2
                                                                             Max Marks: 75

Unit I
Introduction to energy sources: Energy consumption as a measure of prosperity - Energy Sources and their availability - Commercial or conventional energy sources - Non-conventional sources - Renewable energy sources –Energy from Biomass: Introduction - Photosynthesis - Biogas generation .
Unit II
Solar energy collection and storage: Physical Principles of the conversion of solar radiation into heat - Flat plate collectors - Solar pond - Solar cell principles - Solar cell connecting arrangements - Battery storage
Unit III
Wind energy: Introduction - The nature of the wind - Basic components of a WECS (Wind Energy Conversion Systems)
Unit IV
Geothermal energy: Estimation of Geo thermal power - Nature of Geothermal fields - Geothermal sources – direct use - Geo thermal heating – direct heat exchange
Unit V
Energy From Ocean: Introduction – Ocean Thermal Energy Conversion (OTEC) - Energy from tides - Basic principles of tidal power - Site requirements – land – shelf – floating – open cycle – closed cycle – hybrid cycle.(Basic Principles only)

Books for Study:
> 1. G.D.Rai - Non-Conventional Sources of Energy, (IV Edn) Unit I: Ch:1&2, Unit
> 2. Ch:3&4, Unit III: Ch:5, Unit IV: Ch:6&7, Unit V:Ch:8&9.

Books for Reference:

1. G.D.Rai, - Solar Energy Utilization
2. Sukatme - Solar Energy
3. H.C.Jain - Non-Conventional Sources of Energy
4. M.P.Agarwal - Solar Energy
5. Janet Ramage - Energy, A guide book.

Paper 4

NATURE OF LIGHT

Semester IV   Sub Code: 17U4PH4
                                                   Hours/week: 4
                                                   Credit: 4
                                                   Max Marks: 75

Unit – I:
Geometrical optics: Cardinal points – Newton's formula for conjugate foci of a convex lens system – angular dispersion and dispersive power - Deviation without dispersion and dispersion without deviation – Direct vision spectroscope – Narrow angled prism-determination of μ - spherical and chromatic aberrations -concept of eye piece – Huygen's and Ramsden's eye pieces and their comparison.

Unit – II:
Interference: Theory and conditions of interference – Air wedge -Fresnel's biprism – Theory of interference fringe – Calculation of thickness of thin glass sheet - Michelson's interferometer – determination λ and $d\lambda$. Fabrey – Perot interference fringes – Distribution of intensity.

Unit – III:
Diffraction: Fresnel and Fraunhoffer diffraction – Fresnel's explanation for rectilinear propagation of light – Fresnel's half period zone – zone plate – diffraction at a straight edge – plane transmission grating – oblique incidence. Resolving power of prism and grating - comparison of prism and grating spectra.

Unit – IV:
Polarization: Polarization – Nicol prism – Nicol prism as polarizer and analyzer – Huygen's explanation of double refraction in uniaxial crystals (negative crystals) – Quarter and half wave plate– elliptically and circularly polarized light – production and detection -optical activity – Fresnel theory for optical rotation.Laurante Half Shade Polarimeter

Unit – V:
LASER physics: Population inversion – pumping – lasing medium – Meta state – types of LASERS – Ruby, He-Ne, CO_2 and Nd: YAG LASERS – introduction to tuned LASERS – comparison of solid and gas LASERS - LASER applications – Holography.

Books for study:
1. Optics and Spectroscopy - R. Murugeshan, S.Chand and company Ltd.
2. A text book of Optics– Brijlal and Subramniam, S.Chand and company Ltd.
3. Fundamental of Optics – D.R. Khanna and H.R. Gulati, R.Chand and company Ltd.
4. Optics – A. Ghatak, Tata Mc Graw Hill.
5. Lasers and non-linear Optics – 2nd edn. B.B. Laud, New Age international.

Books for reference:
1. Optics– C.L. Arora, S.Chand and company Ltd.
2. Optics – B. N. Vasudeva, S.Chand and company Ltd.
3. Laser fundamentals – William T Silfast C

SKILL BASED SUBJECT
PAPER II

ELECTRONIC APPLIANCES

Semester IV

Sub Code: 17U4PHSB
Hours/week: 3
Credit: 3
Max Marks: 75

Unit I
Active and Passive devices – Resistors – types – characteristics – color coding – capacitors – type – characteristics – capacitors and chokes – transformers –

Unit II
Testing of diodes,transistors and ICs – Analog and digital multimeters – CRO – waveform verification – usage of bread board.

Unit III
Principle and block diagram of TV transmitter and receiver – antennas – dipole - Yagi-Uda antenna- Dish antenna – DTH system – LCD – LED.

Unit IV
Mobile communication system – mobile antenna and their range – SIM - concept of blue tooth – principle of GSM and CDMA.

Unit V
Interfacing devices – Printer – Concept of Xerox machine – MODEM – FAX – Introduction of Internet – Wi-fi.

Books for study:
1. Principles of Electronics – V.K. Metha, S. Chand & Co., 2001.
2. Funnctional electronics- Ramanan.
3. Elements of electronics – Bagde and Singh
4. Monochrome and colour Televsion – Gulati
5. Basic electronics - B. Grob, McGraw Hill, NY 1989.

NON-MAJOR ELECTIVE II

ELECTRIC AND ELECTRONIC APPLIANCES

Semester IV

Sub Code: 17U4PHNM
Hours/week: 2
Credit: 2
Max Marks: 75

Unit I

Principle and uses of Galvanometer, ammeter, voltmeter and multimeter – Electrical energy – power – Watt – consumption of electrical power.

Unit II

Electric fans – wet grinder – mixer – water heater - iron box – microwave oven – stabilizers (Principle and working ideas only)

Unit III

Principle and block diagram of TV transmitter and receiver – antennas – dipole - Yagi-Uda antenna- Dish antenna – DTH system.

Unit IV

Mobile communication system – mobile antenna and their range – SIM - concept of blue tooth – principle of GSM and CDMA.

Unit V

Interfacing devices – Printer – Concept of Xerox machine – MODEM – FAX – Introduction of Internet.

Books for study:
1. A text book in electrical technology – B.L. Theraja, S. Chand & Co.,
2. A text book of electrical technology – A.K. Theraja
3. Performance and design of AC machines – M.G. Say, ELBS Edn.
4. Semiconductor physics and opto electronics _ P.K. Palanisamy
5. Basic Electronics – B.L. Theraja, S.Chand & Co.
6. Principles of communication engineering – Arokh Singh and A K Chhabra, S.Chand & Co.

Paper 5

ELECTRICITY AND MAGNETISM

Semester V
Subject code: 17U5PH 5
Hours/week: 5
Credit : 5
Max marks: 75

Unit I
Electrostatics:
Electrostatic potential – electric potential as line integral of electric field – relation between electric potential and electric field in vector form – capacitance of a spherical and cylindrical capacitor – energy of a charged capacitor – energy density – loss of energy due to sharing of charges – the quadrant electrometer – heterostatic and idiostatic uses.

Unit II
Current electricity and Thermo electricity:
Carey Foster bridge – theory – determination of temperature coefficient of resistance – potentiometer - calibration of high range voltmeter – Seebeck, Peltier and Thomson effects – laws of thermoelectric circuits – Peltier coefficient – Thomson coefficient – application of thermodynamics to a thermocouple and expressions for Peltier and Thomson coefficients – thermoelectric diagram and uses.

Unit III
Chemical effects and Magnetic effects of electric current :
Electrical conductivity of an electrolyte – Faraday's laws of electrolysis – Determination of specific conductivity of an electrolyte (Kohlrausch bridge) – Gibbs Helmholtzs equation for the emf of a reversible cell – calculation of emf of a Daniel Cell – theory of moving coil Ballistic Galvanometer – Damping correction – Absolute capacitance of a capacitor-Comparison of mutual inductances.

Unit IV
Electromagnetic induction and Transient currents :
Faraday's laws of electromagnetic induction in vector form – absolute mutual inductance by BG – Growth and decay of current in a circuit containing resistance and inductance. Growth and decay of charge in a circuit containing resistance and capacitor – measurement of high resistance by leakage – growth and decay of charge in a LCR circuit – condition for the discharge to be oscillatory – frequency of oscillation.

Unit V: **Magnetic properties of materials:**
Susceptibility – permeability – intensity of magnetization and the relation $B=\mu_0(H+I)$ - Properties of dia, para and ferro magnetic materials – Langevin's theory of diamagnetism and paramagnetism – Weiss theory of ferromagnetism-antiferromagnetism- B-H curve-Hysterisis and its experiments.

Books for Study:

1. Electricity and Magnetism, Brijlal and Subramanian, 6th Edn., Ratan & Prakash, Agra
2. Electricity and Magnetism, R Murugeshan, 8th Edn, 2006, S Chand & Co., New Delhi
3. Electricity & Magnetism, M Narayanamurthy & N Nagarathnam, 4th Edn, National Publishing Co., Meerut

Books for Reference:

1. Electricity and Magnetism, Sehgal D L, Chopra K L, Sehgal N K, Sultan Chand & Sons, New Delhi
2. Mechanics and Electrodynamics, Brijlal, N Subramanyan and Jivan Seshan, 2005, Eurasia Publishing House (Pvt.) Ltd., New Delhi.
3. Introduction to Electrodynamics, David J Griffiths, 2nd Edn. 1997, Prentice Hall of India Pvt. Ltd., New Delhi.
4. Electricity & Magnetism by K K Tewari, S Chand & Co., 3rd Edition, 2001.

Paper 6

ATOMIC PHYSICS AND SPECTROSCOPY

Semester V

Subject code: 17U5PH 6
Hours/Week 5
Credit : 5
Max marks: 75

Unit I
Discharge phenomenon through gases:
Moving of a charge in transverse electric and magnetic fields – specific charge of an electron – Dunnington's method – Determination of the electronic charge –Millikan'oil drop method - Positive rays – Production and Properties - Thomson parabola method – Aston and Dempster mass spectrograph

Unit II
Atomic Structure:
Vector atom model – spatial quantization and spinning of electron – various quantum numbers - Pauli's exclusion principle –Magnetic dipole moment due to orbital motion of electron- Bohr magneton – angular momentum and magnetic moment – coupling schemes – LS and JJ coupling – Stern and Gerlach experiment - Spectral terms and notations – selection rules – intensity rule and interval rule – fine structure of sodium D lines .

Unit III
Ionization potential and splitting of energy levels:
Excitation and ionization potential – Davis and Goucher's method – Zeeman effect – Larmor's theorem – Debye's explanation of normal Zeeman effect – Anamalous Zeeman effect – theoretical explanation. Lande's 'g' of D_1 and D_2 lines of sodium – Paschen back effect – Stark effect - H_α lines (qualitative treatment only).

Unit IV
Molecular Spectroscopy:
Types of Spectra – salient features of rotational spectra – molecular rigid rotator & Non-rigid rotator – rotational energy levels – selection rules - salient features of Vibrational - rotational Spectra – energy levels of Harmonic oscillator.

Unit V
Raman Spectroscopy:
Raman Effect and its features - Raman Spectroscopy – Classical & Quantum theory of Raman Spectra – Vibrational and Rotational Raman Spectra - Stokes and anti Stokes lines – Structure determination from Raman and infra-red spectroscopy.

Books for study:

1. Modern physics, R Murugeshan, S Chand & Co., New Delhi , 2004
2. Atomic and Nuclear physics, N Subramanian and Brij Lal, S Chand & Co. – 2000
3. Concepts of Modern physics, A Beiser, Tata McGraw Hill, New Delhi 1997
4. Elements of Spectroscopy – Gupta, Kumar, Sharma , Pragati Prakasan.
5. Fundamental of Molecular Spectroscopy - C.N. Banwell and E.M. Mc Cash, 4th Ed ,Tata McGraw Hill, New Delhi 1994.
6. Spectroscopy – Gurdeep Chatwal and Anand, Himalaya Publishers.

Books for Reference:

1. Atomic physics by A B Gupta and Dipak Ghosh, ooks and Allied Publishers
2. Spectroscopy Vol. I & II - Walker and Straw, Chapman and Hall, 1967.
3. Elements of Spectroscopy Atomic, molecular and laser physics,19th edition, by Gupta, kumar, Sharma, Pragati Prakashan Publication, 2006.
4. Molecular Structure and Spectroscopy, . Aruldas, Prentice Hall of India,2001
5. Basic Principle of Spectroscopy, Raymond Chang McGraw Hill Kogakusha Ltd.
6. Spectroscopy, H. Kaur, Pragati Prakashan Publication, 2nd Edition, 2005.
7. Atomic and Molecular Spectroscopy - M.C. Gupta, New Age international, New Delhi, 2001

Paper 7

SOLID STATE PHYSICS AND MATERIALS SCIENCE

Semester V

Subject code: 17U5PH 7
Hours/Week 5
Credit : 5
Maximum marks: 75

SOLID STATE PHYSICS
Unit I: **Fundamentals of crystallography:**

Space lattice – unit cell – lattice parameters – crystal systems and Bravais lattices – Atomic radius and Packing factor of SC,BCC, FCC crystal systems - crystal planes Miller indices – symmetry elements of a crystalline solid – point groups - space group – Bragg's law - X-ray diffraction methods : powder crystal method and rotating crystal method.

Unit II: **Growth and imperfection in solids:**
Crystal imperfection phenomena – nucleation – different types of nucleation – nucleation parameters of a spherical nucleus – crystal growth techniques – solution growth – solution, solubility and supersaturation. Imperfection in solids: point defect – Frenkel and Schottky defects – Line defects – Edge dislocation and screw dislocation – surface defects – grain boundary.

MATERIALS SCIENCE
Unit III
Classification of materials: Properties of Engineering materials – Materials Structure – primary and secondary bonds – bonds formation – Ionic bond – Covalent Bond – Metallic Bond – Comparison of Bonds – Secondary Bonds - Phase diagram - construction of phase diagrams (only Fe-C and Fe-Fe).

Unit IV
Dielectrics:
Dielectrics – Polarization – Claussius Mossotti Relation-Electric Breakdown – Ferroelectric materials – Electrostriction – Piezoelectricity – Uses of Dielectrics – Magnetic Properties – Classification – Magnetostriction – Soft and Hard magnetic materials-Dipolar dispersion-frequency dependence of dipolar polarisability.

Unit V
Non-Destructive Testing (NDT):
Introduction - defects in materials - NDT and its advantages – ultrasonic methods: principle of pulse echo method - ultrasonic flaw detector — rail road inspection, wall thickness measurement – Liquid Penetration Testing (LPT) – Magnetic Particle Testing (MPT) - sensitivity and limitations of LPT and MPT.

Books for study:

1. Introduction to solid state physics, Kittel, Wiley Eastern Ltd., 2003
2. Solid state Physics, R.L Singhal, Pragati Prakasan, Meerut
3. Material science, M Arumugam, Anuradha agencies and Publishers, Kumbakonam , 2005
4. Materials science and Engineering by V Raghavan, Prentice Hall of India Private limited, New Delhi 2004
5. Materials Science, P.K. Palanisamy, Baldev Singh et. Al

Books for Reference:

1. Solid State Physics, S. O. Pillai, New age Int, 1998
2. Introduction to solid by Azaroff, Tata McGraw Hill Co. 1997
3. Solid State Physics by A J Dekker, Macmillan India 1985
4. Introduction to Ceramics, Kingery.W.D., Howen.H.K. and Unimann. D.R., John Wile and Sons, 2nd Edition, 1991
5. Material Science for engineers, Van Vlack.L., Addison Wesley, 1995
6. Non-destructive testing methods, McGonnagle W. J., McGraw Hill Co., New York, 1961.
7. Crystal Growth by Santhana Raghavan and P. Ramasamy KRU Publication, Kumbakonam.

Paper 8

SPECIAL ELECTRONICS – I

Semester V   Subject code: 17U5PHE1
                                                       Hours/Week 6
                                                       Credit : 5
                                                       Maximum marks: 75

Unit I
Rectifiers and Oscillators:
Rectifiers: Half-wave, full-wave rectifiers and bridge rectifiers using diodes – efficiency and ripple factor.
Oscillators: Classification – feed back in oscillators – Phase-shift, Hartley and Colpitt's oscillators – frequency of oscillation and condition for sustained oscillations – stability of oscillators – crystal oscillators.

Unit II
Amplifiers: Small signal amplifiers – Two-port representations of transistor – h-parameters – AC equivalent circuit using h-parameters – expressions for current gain, voltage gain input impedance, output impedance and power gain in CE amplifier - RC coupled amplifier – frequency response –classification of amplifiers – class A & B power amplifier – Darlington pair.

Unit III
Semiconductors and electronic devices: FET and its characteristics – MOSFET and its characteristics - UJT, equivalent circuit and V-I characteristics of UJT – UJT as relaxation of oscillator – Integrated circuits – fabrication of diodes, transistors, resistors and capacitors using monolithic technique.

Unit IV
Wave shaping circuits and Optoelectronic devices: Time constant – clipping and clamping circuits – multivibrators – astable, monostable and bistable multivibrators.
LED – LCD – Photo diodes – p-i-n photo diodes – high speed photodiodes - long wavelength photodiodes - photo transistor – optoelectronic amplifier.

Unit V
Principles of communication: Concepts of analog and digital communication - Digital communication system- block diagram - Base-band transmission : PCM - Signal to Noise Ratio (SNR) – Base band modulation and demodulation techniques: FSK and PSK - Spectrum allocation for mobile communication - cell structures design – block diagram .

Books for study:

1. Principles of electronics, V K Mehta, S Chand & Co., 5th edition 2001
2. Elements of electronics, Bagde and S P Singh
3. Basic and applied electronics, M Arul Thalapathi, Comptek Publishers, Chennai 2005
4. Linear Integrated Circuits, D. Roy Choudhury and Shail Jain – New age international (P) Ltd.
5. Mobile Information Systems , Walker, J., Artech House, Inc., Boston London 1990.

Books for reference:

1. Integrated Electronics, Jacob Millman and Christos C. Halkias – McGraw Hill international 1971.
2. Electronic principles, Malvino, TAta Mc Graw Hill, New Delhi.
3. Electronic devices and circuits, Allen Mottershed
4. Solid state electronics, Manna, Tata McGraw Hill
5. GSM System Engineering, Mehrotra, A., Artech House, Inc., Boston London 1997.
6. An Introduction to GSM, Redl, S.M., Weber, M.K., Oliphant, M.W, Artech House, Inc., Boston London 1995.

SKILL BASED SUBJECT

PAPER III

THE APPLICATIONS OF PHYSICS IN DAY - TODAY LIFE

Semester V

Subject code: 17U5PHSB
Hours/Week 3
Credit : 3
Maximum marks: 40

Unit I
Introduction of electronic components: Identification of components: Capacitors, Transistor, IC - circuits and their properties – applications – Usage of Multimeter.

Unit II
TV components: Picture tube – electron gun and focusing – Yoke & centering magnets – LCD – LED.

Unit III
Introduction of Internet: searching engine (Google) and its applications : Search options – instant search – functionality : special features. Concept of GPS: – LAN-Networking, Wi-Fi.

Unit IV
Fiber optics communication: Basic principles, Single and multi mode, wave guides (any one type), Preparation of optical fiber: vapour phase (Modified Chemical Vapour Deposition), liquid phase (double crucible method) – Fiber optics communication system (Block diagram only).

Unit V
Launching Vehicle and Navigators: PSLV, GSLV : History - Basic principles – development –descriptions- Liquid boosters - Different stages.

Books for Study:
1. A text book of electrical technology – B.L. Theraja, S. Chand and Co.,
2. Basic television, theory & servicing, A text lab manual II & IVth
3. Television simplified – Milton S. Kiver
4. Optical fiber communication: principles and practice, John M Senior, PHI, 2nd edition
5. http://www.google.com.

Books for reference:
1. Transistor substitution and manual book compiled by - Manahar Lotia BPB publications
2. Optical fiber communications, Gerd Keiser, McGra-Hill, 2nd edition.

Paper 9

NUCLEAR AND PARTICLE PHYSICS

Semester VI

Subject code: 17U6PH8
Hours/Week 5
Credit : 5
Maximum marks: 75

Unit I
Nuclear Structure and models:
Liquid drop model: Bethe-Weizacker's mass formula – Bohr-Wheeler theory – Shell model: Evidences – theory – energy level diagram – spin-orbit interactions - magic numbers – nuclear stability. Nuclear spin, determination of magnetic dipole moment, electric quadrupole moment, parity of nuclei, isotopicspin, nuclear forces – meson theory of nuclear forces.

Unit II
Nuclear decay:
Radioactive disintegration – law of Radioactive decay- Successive radioactive transformation – transient and secular equilibrium – radioactive dating and carbon dating – Geiger-Nuttal law - alpha particle disintegration energy – alpha particle spectra – Gamow's theory of alpha decay(qualitative)
Beta ray spectra – origin – neutrino theory of beta decay – electron capture – gamma rays – determination of wavelength by Dumond – crystal spectrometer – nuclear isomerism.

UnitIII
Particle accelerators: Cyclotron – synchrocyclotron – betatron – electron synchrotron – proton synchrotron (Bevatron)
Detectors: GM counter – ionization chamber – bubble chamber – scintillation counter – photographic emulsion techniques.
Unit IV
Radiation Physics:
Nuclear fission – Chain reaction – four factor formula – reactor theory – critical size of a reactor – general aspect of reactor design– reactor shielding – reactor control – classification of reactors – pressurized heavy water reactor – fast breeder reactor – Nuclear fusion– source of stellar energy — C-N cycle-P-P cycle, Van-allen belts, Aurora Borails.

Unit V
Particle Physics:
Classification –Four types of interaction   - spin and conservation laws - parameters of elementary particles – mass – particles and anti particles – quantum number of elementary particles – invariance principles – properties of elementary particles – nucleons – detection of anti protons – explanation of the Eight-fold way theory.

Books for study:

1. Modern Physics by R Murugeshan, S Chand & Co., New Delhi , 2004
2. Introductory Nuclear Physics, K. S. Krane, Wiley, Newyork, 1987.
3. Nuclear Physics, R.R. Roy and B.P. Nigam, Wiley, Newyork, 1983.
4. Nuclear Physics, Pandya and Yadav
5. Introduction to elementary particles, D. GriffithsHarper and Row, Newyork, 1987.

Books for reference:

1. Nuclear Physics, V. Devanathan, Narosa, 2005.
2. Introduction to Nuclear Physics, H.A. Enge, Addison-Wesley, 1975
3. Nucleon-Nucleon interaction, G.E. Brown and A.D. Jackson, North-Holland, Amsterdam, 1976.
4. Introductory Nuclear Physics, Y.R. Waghmare, Oxford IBH, Bombay, 1981.
5. Elementary particles, J.M. Longo, McGraw-Hill, New York, 1971.

Paper 10

RELATIVITY & QUANTUM MECHANICS

Semester VI

Subject code: 17U6PH9
Hours/Week 5
Credit : 5
Maximum marks: 75

Unit I

Relativity: Postulates of special theory of relativity – Lorentz transformation equations – length contraction – Time dilation – relativity of simultaneity – law of addition of velocities – variation of mass with velocity – relativistic kinetic energy equations – Minskowiski space- postulates of general theory of relativity – gravitational red shift.

Unit II

Wave Mechanics: Postulates of wave mechanics - Failures of classical physics **-** Matter waves – deBroglie wavelength – Gomov's experiments and verification of de-Broglie wavelengths - wave velocity, group velocity and Bohr's correspondence principles – Heisenberg's uncertainty principle – applications of uncertainty principle –– Hermition operators for dynamical variables and its properties.

Unit III
Basic Formalism of Quantum mechanics: Photoelectric effect and black body radiation – 3K background radiation - Postulates of quantum mechanics and its operators - Wave function properties: Probability density- Orthogonal and Orthonormal condition – Expectation values – Continuity equation - Ehrenfest theorem.

Unit IV
Schrödinger's equations and its applications: Schrödinger equation for time dependent and independent particle for Free and bound state - linear harmonic oscillator – zero point energy – particle in a box (one dimension) – square well potential– Rectangular potential barrier: Penetration and tunneling effect – Rigid rotator- Spherical symmetric potential function- Hydrogen atom – radial wave function.

Unit V
Angular Momentum techniques in Quantum mechanics: Quantum mechanical definition of angular momentum **-** Eigen values and eigen functions of angular momentum – Commutation rules for angular momentum operators – Ladder operators – Eigen value spectrum of angular momentum matrices.

Books for study:

1. R Murugeshan, Modern Physics, S Chand & Co., New Delhi , 2004
2. Quantum Mechanics, V. Devanathan, Narosa , 2006.
3. Quantum mechanics, Sathyaparakash, Pragati Prakasan, Meerut.
4. Introduction to quantum mechanics, Gupta Kumar and Sharma, Kedar Nath and Ram nath
5. Quantum Mechanics, V.K.Thangappan, Narosa.
6. Quantum mechanics, G. Aruldas, Prentice Hall of India, New Delhi, 2006.

Books for Reference:

1. A Text book of Quantum Mechanics , P.M.Mathews and K.Venkatesen, Tata Mcgrw Hill.
2. Quantum mechanics by Ghatak and Loganathan, McMillan
3. Basic quantum mechanics by A Ghatak, McMillan India (2002)
4. R. Resinik, Introduction to special theory of relativity,
5. The Feynman Lectures on Physics, R.P.Feynman, R.B.Leighton and M.Sands

Paper 11

SPECIAL ELECTRONICS – II

Semester VI

Subject code: 17U6PHE2
Hours/Week 5
Credit : 5
Maximum marks: 75

Unit I
Digital fundamentals:
Number systems – decimal, binary, octal and hexadecimal systems – conversion from one number system to another. Codes – BCD code – ASCII code – Binary arithmetic – AND, OR circuits using diodes and transistors – NOT using transistors – NAND, NOR and EX-OR – functions and truth tables. NAND & NOR as universal gates –TTL NAND – ECL OR / NOR.

Unit II
Combinational and sequential circuits: - Flip-flops : RS, Clocked RS, JK and JK master slave flip flops. Counters –synchronous and asynchronous counters - decade counter - timing diagrams. Registers : shift left and shift right registers – serial and parallel registers.

Unit III

Data processing circuits and memories:– Laws of Boolean algebra - Demorgan's theorems – Arithmetic building blocks – Half and full adder – Half and full subtractor – Karnaugh map –2,3 and 4 variables – sum of products method – NAND-NAND circuits – product of sums methods – Memory addressing : ROM, PROM, EPROM – dynamic RAM – basic memory cells.

Unit IV
Linear integrated circuits - I: OPAMP – Parameters – Inverting and Non-inverting amplifier – Virtual ground – CMRR - Op-amp as voltage follower, adder, subtractor and Averager – Integrator and differentiator – solving second order differential equation - Comparators – inverting and non inverting comparators.

Unit V
Linear integrated circuits - II: OPAMP Oscillators: Phase shift and Wien-bridge sine wave oscillators - astable, monostable and bistable circuits – triangular wave generator – voltage controlled oscillators (VCO).

Books for study:

1. Digital Principles and Application, Malvino and Leech, 2000, 4th edition, Tata McGraw Hill, New Delhi.
2. Integrated Electronics,Millman and Halkias, 1972, International edition, McGraw Hill, New Delhi.
3. Digital fundamentals, Floyd, Pearson Education 8th Edition 2004, S Chand Publications
4. Linear Integrated Circuits, D. Roy Choudhury and Shail Jain, New age international (P) Ltd.
5. Opamps and integrated circuits, R. A. Gaeykwad, Prentice-Hall of India Pvt. Ltd.

Books for Reference:

1. Computer architecture and logic design by T C Bartee, McGraw Hill, 1991.2
2. Digital integrated electronics by Herbert Taub and Donald Schilling, McGraw Hill
3. Fundamentals of Digital Electronics and Microprocessors, Anokh Singh and A K Chhabra, 2005, 2nd revised and enlarged Ed., S Chand & Co. Ltd., New Delhi
4. Integrated Electronics by Jacob Millman and Christos C. Halkias – McGraw Hill international 1971.
5. Digital computer electronics by Albert Paul Malvino – TMH Edition 1992.
6. Opamps and linear integrated circuits, R. F. Coughlin and F. F. Driscol. Prentice-Hall of India Pvt. Ltd.

Paper 12

MICROPROCESSOR AND ITS APPLICATIONS – 8085

Semester VI   Subject code: 17U6PHE3

Hours/Week 6

Credit : 5

Maximum marks: 75

Unit I

Microprocessor architecture and its operations: Microprocessors – Architecture of 8085 – pin out configurations of 8085 – Bus organization and timings: buses – buffer – address bus, data bus, multiplexing address/data bus and control & status signals – - ALU – registers in 8085 – flags - Interrupts: maskable and nonmaskable interrupts – 8085 interrupts – interrupt priorities.

Unit II

Programming model of 8085: Classification of instructions and format - Addressing modes – stack and subroutine instructions - comparison of stack and subroutine instructions – Logical rotate and compare instructions – RIM and SIM instructions – Simple programs – arithmetic programs: addition, subtraction, multiplication and division

Unit III

Time delay, design of counters and memory interface: Counters – time delay using one and pair of registers – hexadecimal counter – zero-to-nine counter – T-states – delay routines and delay calculations – traffic signal controller.

Memory interface: 2K X 8, 4K x 6 ROM and RAM interface – timing diagram for memory read and memory write cycles.

Unit IV

Interfacing I/O devices: Interfacing concepts – IN and OUT peripheral I/O instructions – interfacing input and output using decoders –Memory mapped I/O – LED display of binary data – comparison of peripheral I/O and memory mapped I/O – Direct memory access (DMA).

Unit V

Interfacing data converters and peripheral devices: – illustration of interfacing 8-bit D/A and successive approximation A/D converters – basics of programmable I/Os – interfacing of programmable peripheral device 8255 – programming 8255A MODE zero- interfacing with A/D converter in BSR mode.

BOOK FOR STUDY:

1. Microprocessor Architecture, Programming and applications with the 8085 – R.S. Goankar, 3rd Edn. Prentice Hall.
2. Fundamental of Microprocessor – 8085 – Architecture, programming and interfacing, V. Vijayendra, S. Viswanathan, Pvt., Ltd. 2003.
3. The Intel microprocessor: Archintecture, Programming and Interfacing, Barry.B.Brey, Pearson education/Prentice Hall of India, New Delhi, 2003
4. Microprocessors and microcontrollers, A.Nagoor Kani, RBA publications, 2005.

BOOKS FOR REFERENCE:

1. Digital computer electronics: an introduction to microcomputers – Malvino , 2nd Edn., Tata McGraw Hill.
2. Fundamentals of Microprocessors and microcomputers – B. Ram.
3. Computer system architecture, Moris Mano, 3rd Edn., Prentice Hall India.
4. Introduction to microprocessors: software, hardware, programming – Lance A. Leventhal, Prentice Hall India.

SKILL BASED SUBJECT

PAPER IV

DIGITAL TECHNOLOGY

Semester VI   Subject code: 17U6PHSB
                                                                                      Hours/Week   3
                                                                                          Credit : 3
                                                                               Maximum marks: 40

Unit I
Analog and digital signals: Storage of information in both analogue and digital forms – storing and recovering information from CD - calculation of an appropriate depth for a pit from the wavelength of the laser light - Advantages of the storage of information in digital over analogue form.

Unit II
Data capture, digital imaging using charge-coupled devices (CCDs): Capacitance - Digitizing the image on a CCD - Quantum efficiency of pixel – materials used for construction of CCD - Magnification – uses of CCD – advantages of CCD compared with the use of film – applications in scientific research and digital technology.

Unit III
Channels of communication: Different channels of communication – pair of wires - coaxial cables - optical fiber - radio waves and satellite communication - mobile communication – Principle of GSM and CDMA – moral, ethical, economic, environmental and international issues arising from the use of mobile phones.

Unit IV
Radiation and medical imaging Physics: Radiation units – exposure – Dosimetry – Radiography – Filters – grids – cassette – X-ray film – film processing – Computed Tomography scanner – function display - mammography. Ultrasound imaging – Magnetic Resonance Imaging – Gamma camera (Only Principle, function and display).

Unit V
Electronics Instruments: Electron optics -Transmission electron microscopy (TEM) – Scanning Electron microscopy (SEM) - Atomic Force Microscopy (AFM) – uses of AFM -preparation of specimen for electron microscopy, Comparisons of SEM, TEM and AFM.

Books for Study:
1. Principles of Electronics, V.K.Metha, S Chand & Co., 5th edition 2001.
2. Mobile Information Systems, Walker.J, Artech House, Inc., Boston London 1990.
3. Basic Radiological Physics Dr. K. Thayalan – Jayapee Brothers Medical Publishing Pvt. Ltd. New Delhi (2003).
4. Christensen's Physics of Diagnostic Radiology: Curry, Dowdey and Murry – Lippincott Williams and Wilkins (1990).
5. Physics of Radiation Therapy: FM Khan – Williamd and Wilkins, Third edition (2003).
6. The essential physics of Medical Imaging: Bushberg, Seibert, Leidholdt and Boone Lippincot Williams and Wilkins, Second Edition (2002).
7. HE Johns and Cunningham – The Physics of Radiology.

Books for reference:
1. GSM System Engineering, Mehrotra.A, Artech House, Inc., Boston London 1997.
2. An Introduction to GSM, Redl, S.M.Weber, M.K., Oliphant, M.W. Artech House, Inc., Boston London 1995.
3. Nuclear medicine physics: Chandra – Lippincott Williams and Wilkins (1998).
4. The Physics of radiology: John R Gunniingham and Johns – Charles C Thomas USA (1990).
5. Medical Imaging Physics: William R Hendee – Mosby, 3rd edition (1992).
6. Advanced Medical Radiation Dosimetry: Govindarajan KN Prentice – Hall of India Pvt. Ltd. New Delhi (1992).
7. Erric Hall Radio Biology for the Radiologist – Lippincott Williams & Wilkins.
8. The Modern Technology of Radiation oncology – Jake VanDyk – Medical Physics Publishing.

PRACTICAL – I (B.Sc Major Physics I year)
(Any 15 experiments only)

Semester I & II   Sub. Code: 17UPHPR1

Credit: 4

Max marks:60

1. Vernier calipers and Screw gauge measurements[*].

2. Vernier microscope and Spectrometer measurements[*].

3. Determination of 'g' and 'k' – Compound pendulum.

4. Determination of Young's modulus – non-uniform bending - pin and microscope.

5. Determination of Young's modulus – non-uniform bending – optic lever – scale and telescope.

6. Determination of rigidity modulus and moment of inertia (with and without symmetrical masses) – Torsional pendulum.

7. Determination of rigidity modulus – Static torsion- scale and telescope.

8. Determination of surface tension of liquid and interfacial surface tension – Drop weight method.

9. Specific heat of a solid – Method of mixtures[*]

10. Specific heat of a liquid – Newton's law of cooling.

11. Thermal conductivity of poor conductor – Lee's disc method.

12. Determination of AC frequency – Sonometer – Steel and Brass wires.

13. Determination of refractive index of the solid prism–Spectrometer (A, D and μ).

14. Determination of dispersive power of the prism – Spectrometer.

15. Determination of N and λ - Hg spectrum – Spectrometer.

16. Determination of unknown resistance and specific resistance – meter Bridge.

17. Calibration of low range voltmeter – Potentiometer.

18. Calibration of ammeter – Potentiometer.

19. Determination of m and B_H – *Tan A* position.

Note: 1. Practical examination at the end of the even semester.

2. * - experiments not for the practical examination.

Books for study and references:

3. Advanced Practical Physics – Worsnop and Flint.
4. B.Sc. Practical Physics – Philomen Raj.
5. A text book of Practical physics – M.N. Srinivasan, Balasubramaniam and R. Ranganathan
6. Practical Physics for B.Sc., - Arul Thalapathi

Semester III & IV   Sub Code: 17U4PHPR2
                                                                    Credit: 4
                                                                    Max Marks: 60

Any 15 experiments

1. Determination of Young's modulus – uniform bending - pin and microscope.

2. Determination of Young's modulus – uniform bending – optic lever.

3. Determination of Young's modulus - cantilever-scale and telescope method.

4. Determination of Moment of inertia of a rectangular lamina and verification of perpendicular axes theorem – Bifilar pendulum.

5. Determination of frequency of the tuning fork and unknown mass-Sonometer

6. Determination of frequency of a vibrator - Melde's apparatus (both mode of vibrations).

7. Determination of velocity of sound in a rod and Young's modulus of the rod – Kundt's tube.

8. Determination of wavelengths of Mercury spectrum – Plane transmission grating-Normal incidence method– Dispersive power - Spectrometer.

9. Determination of wavelengths of Mercury spectrum – Plane transmission grating - minimum deviation – Spectrometer.

10. *i-d* curve – Spectrometer (Determination of A from graph).

11. Determination of thickness of two different thin wires – Air wedge method.

12. Post office box – temperature coefficient of thermistor.

13. Potentiometer – unknown resistance – specific resistance of the given coil.

14. Figure of merit of mirror galvanometer – current and voltage sensitiveness.

15. *Tan B* – Determination of *m* and B_H

16. Determination of B_H - Field along the axis of a coil.

Note: 1. Practical examination at the end of the even semester.

Books for study and references:
1. Advanced Practical Physics – Worsnop and Flint.
2. B.Sc. Practical Physics – Philomen Raj
3. A text book of Practical physics – M.N. Srinivasan, Balasubramaniam and R. Ranganathan
4. Practical Physics for B.Sc., - Arul Thalapathi

Practical III – **General experiments** (B.Sc Major Physics III year)
(Any 15 experiments only)

1. Young's modulus – Koenig's method – non uniform bending.

2. Newton's rings – R_1, R_2 and μ of a convex lens.

3. Spectrometer – narrow angled prism – angle of deviation – normal incidence and normal emergence.

4. Spectrometer – Cauchy's constant.

5. Spectrometer – Hydrogen spectrum – determination of Rydberg's constant.

6. Spectrometer – Solar spectrum – determination of Rydberg's constant.

7. Spectrometer – $i\text{-}i'$

8. Carey-Foster Bridge -Temperature coefficient of the given coil.

9. Potentiometer – EMF of a thermocouple.

10. Potentiometer - Conversion of table galvanometer into Voltmeter and its calibration.

11. Potentiometer - Conversion of table galvanometer into Ammeter and its calibration.

12. Potentiometer – calibration of high range voltmeter.

13. BG – Figure of merit and quantity sensitiveness.

14. BG – absolute capacitance of a capacitor.

15. BG – Coefficient of mutual inductances.

16. BG – comparison of mutual inductances.

17. BG – comparison of emfs.

18. BG – comparison of capacitances.

19. BG—High resistance by leakage.

20. Determination of B_H – Null deflection method

21. Determination of m and B_H – *TAN C* position.

22. Searle's vibration magnetometer (bottle type) – Determination of B_H.

Books for study and references:
1. Advanced Practical Physics – Worsnop and Flint.
2. B.Sc. Practical Physics – Philomen Raj
3. A text book of Practical physics – M.N. Srinivasan, Balasubramaniam and R. Ranganathan
4. Practical Physics for B.Sc., - Arul Thalapathi

Practical IV – **Advanced Electronics & Microprocessor experiments**
(B.Sc Major Physics III year)
(Any 15 experiments only)

Semester V & VI   **Subject code:** 17U4PHPR4
                                                                   Credit: 5
                                                                   Max marks: 60

1. Bridge rectifier – regulation characteristics.

2. RC coupled amplifier – gain and frequency response

3. Hartley oscillator/Colpitt's oscillator.

4. IC regulated power supply 7805 – voltage regulation.

5. Dual IC regulated power supply 7805 & 7905 – voltage regulation.

6. NAND and NOR as universal gates.

7. Verification of Boolean algebra / De Morgan's theorem.

8. Half adder and Full adder using NAND gates.

9. Half subtractor and Full subtractor NAND gates.

10. UJT characteristics and UJT as relaxation oscillator

11. Op-Amp – Voltage follower, CMMR, summer, scalar and averager.

12. Op-Amp – differentiating and integrating circuits.

13. Op-Amp – Astable Multivibrator

14. Op-Amp – Digital to analog converter – weighted resistor method.

15. Timer NE 555 – Astable Multivibrator

Microprocessor experiments

16. Additions, subtraction – 8-bit binary and BCD.

17. Multiplication and division - 8-bit binary

18. Picking up the largest / smallest in an array.

19. Ascending order / descending order.

20. Code conversions: Binary to BCD and BCD to Binary, Binary to ASCII and ASCII to Binary.

Books for reference (For Practicals III & IV):

1. A text book of Practical Physics, C. C. Ouseph, V. Srinivasan and R. Balakrishnan, S.V. Publishers and Pvt. Ltd. Chennai.
2. B.Sc. Practical Physics – M.N. Srinivasan, R.Ranganathan S. Balasubramanian, S. Chand and company, Chennai.
3. B.Sc. Practical Physics – S.R. Govindarajan,
4. B.Sc. Practical Physics – Arul Thalapathi, Comptek, Chennai.
5. Practical Physics and Electronics – C. C. Ouesph, U.J. Rao, V. Vijayendran, S. Viswanathan, Pvt., Ltd. Chennai.
6. Fundamentals of Microprocessors and microcomputers – B. Ram.
7. Fundamental of Microprocessor – 8085 – Architecture, programming and interfacing – V. Vijayendran, S. Viswanathan, Pvt., Ltd. 2003v

MUTHURANGAM GOVT. ARTS COLLEGE (Autonomous),
Vellore-2.

PATTERN OF QUESTION PAPER

B.Sc. – PHYSICS (Main & Allied)

Time: **3** Hours   Maximum: **75** mark**s**

SECTION – A (10 x 2 = 20 marks)
No Choice
Answer **ALL** questions.
All questions carry equal marks.
(Two questions from each unit).

SECTION – B (5 X 5= 25 marks)
Either or Pattern
All questions carry equal marks.
Out of 10 questions three questions must be problems
(One question from each unit).

SECTION – C (3 x10 = 30 marks)
Open Choice 3/5
All questions carry equal marks.
(One question from each unit).

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS) VELLORE – 632 002

M.Sc. (Semester with CBCS)
(for the candidates submitted from July 2017-2018)

BRANCH: PHYSICS

SYLLABUS

REGULATIONS
(With effect from Academic Year 2017-2018)

REGULATIONS
(With effect from Academic Year 2017-2018)

Choice Based Credit System (CBCS):
This is to enhance the quality and mobility of the students within and between the Universities in the country and abroad.

1. Eligibility for admission to the course:

A candidate who has passed in the B.Sc degree examination in Physics with Mathematics as one of the allied subject or an examination of any other university accepted by the syndicate as equivalent thereto shall be eligible for admission to M.Sc degree course in Physics.

2. Duration of the Course
The course of the degree of Master of Science shall extend over a period of **TWO** academic years comprising of four semesters with two semesters in one academic year.

3. Course of Study

Core Subject: There shall be 16 core papers including practical's and project with 88 credits and compulsory paper Human Rights with 2 credits. Theory examinations shall be conducted in the core subjects at the end of every semester. However, there shall be practical examinations in the core subjects at the end of even semester.

Elective courses: Four elective papers with (4x3 =) 12 credits are to be offered one in each semester.

4. Project
There will be a Project work at the end of the Semester IV. The guidelines for the Project work with viva-voce as follows.
   a) The Project should be valued for 50 marks by an external examiner and viva voce should be conducted by the external examiner and the internal guide/teacher concerned.
   b) The Project Report may consist of 40 to 50 pages.
   c) The candidate has to submit the project report 15 days before the commencement of the IV semester examinations.
   d) A candidate who fails in the Project/Dissertation may resubmit the report (on the same topic) with necessary modification/correction/ improvements in the subsequent semester examination for evaluation.
   e) Each candidate shall be required to appear for viva-voce Examination (in defense of the Project only)

5. **Examinations**:

There shall be theory examinations at the end of each semester, for odd semesters in the month of October/November, for even semesters in April/May. However, there shall be Practical examinations at the end of even semesters.
The following question paper pattern shall be followed.

1

I For Theory papers,

External maximum 75 marks – (Ext. 75 +Int.25 = Total. 100)			
Section A	Short answer questions of either / or type [like 1 a (or) b]	5 x 6 = 30	5 questions -1 from each unit
Section B	Essay-type questions (Answer any 3 out of 5)	3 x 15 = 45	5 questions -1 from each unit
Note: In Section 'B' one of the question shall be application oriented or a problem from any one of the unit			

II For Practical,

External maximum 60 marks – (Ext. 60 +Int.40 = Total. 100)	
Record	10 marks
Formula with expansions / circuit diagram / algorithm	10 marks
Observation / Program	20 marks
Calculation (including graphs)	15 marks
Result	5 marks

PG DEGREE COURSE CBCS PATTERN – M.Sc., PHYSICS
THE COURSE OF STUDY AND SCHEME OF EXAMATIONS

Year/ Sem.	Paper	Subject	Subject Code	Title of the Paper	Ins. Hrs. / Week	Credit	IA	End Sem. exams	Total
I YEAR I SEMESTER	1	Core	17P1PH01	Classical mechanics and Relativity	5	4	25	75	100
	2	Core	17P1PH02	Mathematical Physics - I	5	5	25	75	100
	3	Core	17P1PH03	Electromagnetic theory	5	4	25	75	100
	-	Core	17PPHPR01	General experiments – Practical - I	5	-	40	60	-
	-	Core	17PPHPR02	Advanced Electronics - Practical - II	5	-	40	60	-
	Elective I	E1	17P1EPH1	Electronic devices and integrated Electronics	5	4	40	60	100
				Total	**30**	**17**			**400**
I YEAR II SEMESTER	4	Core	17P2PH04	Statistical Mechanics	5	4	25	75	100
	5	Core	17P2PH05	Mathematical Physics - II	5	5	25	75	100
	6	Core	17P2PH06	Quantum Mechanics - I	5	5	25	75	100
	7	Core	17PPHPR01	General experiments – Practical - I	5	5	25	75	100
	8	Core	17PPHPR02	Advanced Electronics - Practical - II	5	5	25	75	100
	Elective II	E2	17P2EPH2	Laser and Fiber Optics	5	4	25	75	100
			17P2HR	Human Rights	2	2	25	75	100
				Total	**32**	**30**			**700**

Year/ Sem.	Paper	Subject	Subject Code	Title of the Paper	Ins. Hrs./ Week	Credit	Max. Marks		
							IA	End sem Exams	Total
II YEAR III SEMESTER	9	Core	17P3PH07	Spectroscopy	5	4	25	75	100
	10	Core	17P3PH08	Quantum Mechanics - II	5	5	25	75	100
	11	Core	17P3PH09	Physics of Materials – I	5	4	25	75	100
	-	Core	17PPHPR03	General experiments – Practical III	5	-	40	60	-
	-	Core	17PPHPR04	Advanced Electronics - Practical IV	5	-	40	60	-
	Elective III	E3	17P3EPH3	Advanced Microprocessor and Microcontroller	5	4	25	75	100
				Total	**30**	**17**			**400**
II YEAR IV SEMESTER	12	Core	17P3PH10	Nuclear Physics & Particle Physics	5	4	25	75	100
	13	Core	17P3PH11	Physics of Materials – II	5	4	25	75	100
	14	Core	17PPHPR05	General experiments	5	5	60	40	100
	15	Core	17PPHPR06	Microprocessor 8085/86/51 Practical's	5	5	60	40	100
	16	Core	17PPHPRJ05	Project & Viva voce	5	4	Project 150 + Viva 50		200
	Elective IV	E4	17P4EPH4	Nano Physics	5	4	25	75	100
				Total	**30**	**26**			**600**
				Grand Total	**120**	**90**			**2100**

S. No	Title	Credits
1	Core	72
2	Elective (4X4=16)	16
3	Human rights	2
	Total credits	90

Paper 1

CLASSICAL MECHANICS AND RELATIVITY

Semester I   Subject Code: 17P1PH 1
                                                                    Hours/week: 5
                                                                        Credits: 5
                                                                    Max Marks:75

Unit I

Survey of Elementary Principles: Generalized coordinates – D'Alembert's principle – Lagrange's equations of motion – cyclic coordinates - Lagrangian formulation of conservation of energy, linear and angular momentum.

Two-Body Central Force problem: Equation of motion – first integrals – Kepler's law - scattering by central potential – Virial theorem - Kepler's problem; Scattering in a central force field - centre of mass and laboratory frame.

Unit II

Canonical transformations: Canonical transformation and their generators – condition for a transformation to be canonical – application to simple harmonic oscillator and simple examples - Poisson brackets.

Hamilton Jacobi Theory: Hamilton-Jacobi theory – action angle variables – application to Kepler's problem

Unit III

Mechanics of Rigid Bodies: Angular velocity – Angular momentum – Principal axes Transformation – Rotational kinetic energy of Rigid body – Moment of Inertia of rigid body – Equation of motion of rigid body : Euler's equation – Torque free motion of rigid body : Poinsot solution – Torque free motion of symmetrical rigid body - The motion of symmetrical top under the action of gravity, precession without nutation.

Unit IV

Kinematics of equation: Orthogonal transformations - Euler angels - Rotating frame of reference and Coriolis force.

Small oscillations: Formulation of the problem – transformation to normal co-ordinates – linear triatomic molecule- forced oscillations – effect of dissipative forces on free and forced oscillations.

Unit V

Relativity: Lorentz transformations – four vectors – Lorentz invariance of the four products of two vectors – invariance of Maxwell's equations – relativistic Lagrangian and Hamiltonian for a free particle.

Books for study:

1. Classical mechanics – H. Goldstein, Narosa publishing Housing Pvt. Ltd.
2. Classical mechanics – B.D. Gupta and Sathya Prakash, Kedar Nath Ram Nath.
3. Classical mechanics – Gupta Kumar and Sharma, Pragati Prakasan, 2nd ed., 2006.
4. Introduction to special theory of relativity – R. Resnick, Wiley Eastern.

Books for reference:

1. The Feynman Lectures on Physics – R.P. Feynman, R.B. Leighton and M. Sands, Vols. 1,2 and 3, Narosa Publishing House, New Delhi.
2. Classical mechanics – C.R. Modal, Prentice-Hall of India Pvt. Ltd., New Delhi, 2005
3. Classical mechanics – S. N. Biswas, Books and Allied, Kolkata, 1999.
4. Classical Mechanics – N C Rana and P S Joag, Tata Mc Graw Hill, 2005

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Paper 2

MATHEMATICAL PHYSICS - I

Semester I

Subject code: 17P1PH 2
Hours/week:5
Credits:4
Max. Marks: 75

Unit I

Vector analysis : Vector field – Orthogonal curvilinear coordinates – spherical and cylindrical coordinate systems – expression for gradient, divergence, curl and Laplacian in these coordinates – Stoke's and Gauss theorems – simple applications of Stoke's and Gauss theorem.

Unit II
Linear vector spaces

Vector space – linear operators – representation of vector operators in a basis – linear independence dimension – inner product – Schwartz inequality – orthonormal basis – Gram-Schmidt process.

Unit III
Matrix theory

Characteristic equation of matrix - eigen values and eigen vectors – theorems on eigen values and eigen vectors - Cayley-Hamilton's theorem – inverse of matrix – Diagonalization of Hermition and unitary matrices.

Unit IV
Complex variables: Functions, Differentiation, Cauchy-Riemann conditions - Analytic and harmonic functions, Contour integrals,– singular points – Cauchy's theorem and Cauchy's integral formula –zeros and poles – Cauchy's residue theorem and its applications. Applications of residue theorem, Conformal mapping and application Taylor's theorem and Laurent's theorem.
Applications: (1) Electrostatic fields and complex potentials. Concept of equi-potential surfaces. Solution of two dimensional Laplace's equation as applicable to potential between (1) parallel plates (2) coaxial cylinders.(3) steady state heat flow equation..

Unit V
Green's function

Inhomogeneous differential equations and boundary conditions – eigen function expansion of the Green's function – two-green identities- vector forms of Green's theorem in the plane - reciprocity theorem – Sturm-Liouville type equations in one dimension and their Green's function.

Books for study

1. Mathematical physics – B. D. Gupta, Vikas Pub. Co. Pvt. Ltd.
2. Mathematical physics – H.K. Dass, 2nd S.Chand & Co. Ltd.
3. Mathematical physics – Sathya Prakash, Kedar Nath Ram Nath.
4. Mathematical physics – P.K. Chattopadhyay, Wiley Eastern, Madras, 1990.
5. Engineering Mathematics – Vol. I and III A – M. K. Venkatraman, The National publishing company, Madras.
6. Vector analysis (Schaum's outline series) – M.R. Spiegel.
7. Matrices and Tensors – A. W. Joshi, Wiley Eastern, Madras, 1995.
8. Complex variables (Schaum's outline series) – M.R. Spiegal.

Books for reference

1. The Feynman Lectures on Physics – R.P. Feynman, R.B. Leighton and M. Sands, Vols. 1,2 and 3, Narosa Publishing House, New Delhi, 1988.
2. Mathematical physics – Eugene Butkov, Addison – Wesley, Reading, MA, 1968.
3. Advanced engineering mathematics – Erwin Kreyszig, 8th Ed. Wiley, NY, 1999.
4. Applied mathematics for engineers and physicists – Pipes and Harvil, Tata Mc Graw Hill.
5. Advanced engineering mathematics – M.D. Green Berg, 2nd Ed. International Ed., Prentice-Hall of India Pvt. Ltd. NJ, 1998.
6. Complex variables and applications – R. V. Churchill.

ELECTROMAGNETIC THEORY

Semester I   Subject code: 17P1PH 3
                                                              Hours/week: 5
                                                                 Credits: 5
                                                            Max. Marks: 75

Unit I
Electrostatics: Polarization and displacement vectors – boundary conditions – dielectric sphere in a uniform field – molecular polarisability and electrical susceptibility – electrostatic energy in the presence of dielectric – multipole expansion.

Unit II
Magnetostatics: Biot-Savart law – Ampere's law – magnetic vector potential and magnetic field of a localized current distribution – magnetic moment and force and torque on a current distribution in an external field – magneto static energy – magnetic induction and magnetic field in macroscopic media – boundary condition – uniformly magnetized sphere.

Unit III
Maxwell equations: Faraday's law of induction – Maxwell displacement current – Maxwell equation – vector and scalar potential – gauge invariance – wave equation and plane wave solution – Coulomb and Lorentz gauges – energy and momentum of the field – Poynting's theorem – Lorentz's force – conservation laws for a system of charges and electromagnetic field.

Unit IV
Applications of Maxwell equations: Fields and radiation of localized sources-oscillating electric dipole-Poynting vector and radiated power-Radiation resistance-Radiation from a linear antenna-Antenna arrays-Radiation pressure and electromagnetic momentum- electromagnetic oscillators.

Unit V
Wave propagation: Plane waves in non-conducting media – linear and circular polarization, reflection and refraction at a plane interface – waves in a conducting medium – propagation of wave in a rectangular wave-guide - oscillating electric dipole.

Books for study:

1. Electromagnetic theory and Electro dynamics – Sathya Prakash, Kedar Nath Ram Nath, 11th Edn. 2005.
2. Electromagnetic theory – Chopra and Agarwal, Kedar Nath, 6th Edn. 2005.
3. Introduction to Electrodynamics – D. Griffiths, 3rd Edn. Prentice-Hall of India Pvt. Ltd., 2005.
4. Microwave Engineering – Annapurna Das and Sisir K Das, Tata Mc Graw Hill.

Books for reference:

1. The Feynman Lectures on Physics – R.P. Feynman, R.B. Leighton and M. Sands, Vols. 1,2 and 3, Narosa Publishing House, New Delhi,
2. Classical Electrodynamics - J.D.Jackson, Wiley Eastern.
3. Foundations of Electromagnetic theory - J.R. Reitz, F.J.Milford and R.W. Chirsty, 3rd Edn.
4. Electromagnetic Fields and waves, P. Lorain and D. Corson. CBS Publishers and distributors.
5. Electromagnetic waves and radiating systems- Edward C Jordan and Keith G. Balmain, 2nd Edn., Prentice-Hall of India Pvt. Ltd. New Delhi, 1987.
6. Fundamentals of Plasma Physics – J.A. Bittencourt, Pergamon press, Oxford, 1988

ELECTRONIC DEVICES AND INTEGRATED ELECTRONICS

Semester I   Subject code: 17P1EPH1
                                                                       Hours/week: 5
                                                                           Credits: 4
                                                                      Max. Marks: 75

Unit I
Special Electronic devices and their applications: MOSFET – Construction & working and V-I characteristics of MOSFET - depletion and enhancement modes. MOS invertors-static inverter, dynamic inverter, MOS NAND gates, NOR gates - complementary MOSFET technology: CMOS inverter, CMOS NOR gates and NAND gates- Multi gate transistors – Fin-FET – Gate-all-Around FET - Single electron transistor-3D transistors.

Unit II
Linear analog circuits: Differential amplifiers – salient features of difference amplifier - comparators - instrumentation amplifier – peak detector – zero crossing detector – solutions to simultaneous equations – Butterworth filters: Low pass, High pass, Band pass, Band reject and all pass filters.

Unit III
D/A and A/D convertors: Introduction to convertors - resolution and accuracy - binary weighted resistor D/A converter – R-2R ladder D/A converter – counter type, successive approximation and dual slope A/D converters.

Unit IV
Oscillators: Op-Amp: Phase shift and Wien-bridge sine wave oscillators - astable, monostable and bistable (Schmitt trigger) circuits – triangular wave generator – voltage controlled oscillators – 555 IC: Astable, monostable and Schmitt triggers circuits.

Unit V
Optoelectronic Devices: Principle of operation and characteristics - Communication based LED's – Transient response of LED's – Homo and Hetro junction LED's – pn junction and amorphous silicon solar cells – Conversion efficiency. High speed and long wavelength photo diodes – Optical switching: electro-optic modulator- SEED-Bipolar controller modulator and its applications.

Books for study:
1. Electronic circuits and devices – T. F. Bogart, Universal Book Stall.
2. Introduction to semiconductor devices – M.S. Tyagi, Wiley, NY.
3. Digital principles and applications – Malvino and Leech, Mc Graw Hill.
4. Digital fundamentals – T. L. Floyd, Universal Book Stall.
5. Digital logic and computer design – Moris Mano, Prentice-Hall of India Pvt. Ltd.
6. Electronic Principles and applications – A. B. Bhattacharya, New Central Book Agency Pvt. Ltd, 2006
7. Opamps and integrated circuits – R. A. Gaeykwad, Prentice-Hall of India Pvt. Ltd., 4th ed, 2005.
8. Semiconductor Physics and Opto Electronics – M. Arumugam, Anuradha Agensies.

Books for reference:
1. Semiconductor devices – Physics and technology - S. M. Sze, Wiley, NY, 1985.
2. Digital electronics - Taub and shilling, Mc Graw Hill.
3. Electronic devices and circuit theory – R. L. Bioylestad and L. Nashelsky, 8th Ed. Pearson Education.
4. Digital electronics and logic design – B. Somnath Nair, Prentice-Hall of India Pvt. Ltd. New Delhi, 2002.
5. Opamps and linear integrated circuits – R. F. Coughlin and F. F. Driscol. Prentice-Hall of India Pvt. Ltd., 6th ed., 2006.
6. Operational amplifiers with linear integrated circuits – William Stanley, CBS Publishers and Distributors.
7. Semiconductor physics and devices – Donald A. Neamen, The Mc-Graw hill, Third edition, 2007

Paper 4

STATISTICAL MECHANICS

Semester II   Subject code: 17P2PH 4
                                                                     Hours/week: 5
                                                                     Credits:5
                                                                     Max. Marks: 75

Unit I
Thermodynamics: Thermodynamic potentials, Phase equilibrium – Gibb's phase rule – Entropy of mixing and Gibb's paradox- Phase transition and Ehrenfest's Classification – Landau theory of Phase transition – critical indices – scale transformation and dimensional analysis.

Unit II
 Ensembles: Phase space - Microcanonical ensembles - trajectories and density of states – Liouville's theorem - Canonical and grand canonical ensembles – Partition function – Calculation of statistical quantities - Energy and density fluctuations.

Unit III
Maxwell-Boltzmann statistics: Postulates of classical and quantum statistics – Maxwell-Boltzmann distribution function - Maxwell's law of distribution of velocities – mean values from distributions law– broadening of spectral lines-principle of equipartition of energy.

 Unit IV
Bose-Einstein statistics
Energy and pressure of gas – gas degeneracy- degeneracy of molecular Hydrogen & He molecule- – Bose-Einstein condensation – Landau's theory of Liquid Helium II – black body radiation-Super fluidity: Tisza's two fluid model and second sound.

Unit V
Fermi-Dirac statistics:
Energy and pressure of gas–Slight and strong degeneracy- Thermionic emission and photo electric emission-Pauli's paramagnetism – equation of state at high density – white Dwarf and neutron stars.

Books for study:

1. Statistical mechanics - Gupta, Kumar and Sharma, Pragati Prakasan, 2tst ed., 2006.
2. Statistical mechanics - Sathya Prakash and J.P Agarwal, Kedar Nath Ram Nath, 2005.
3. Thermodynamics, statistical physics and kinetics - Sathya Prakash and T. P. Agarwal,
4. Statistical mechanics - K. Srivastava and J. Ashok, Prentice-Hall of India Pvt. Ltd., 2005.

Books for reference:

1. Statistical mechanics – B.K. Agarwl and M. Eisner, 2nd Edn. New Age International, New Delhi, 1998.
2. Thermodynamics, Kinetic theory and Statistical Thermodynamics – Sear Salinger, 3rd Edn, Narosa publishing house.
3. Fundamentals of statistical and thermal physics – F. Reif, Tata Mc Graw Hill
4. Statistical mechanics and properties of matter – E.S.R. Gopal
5. Statistical physics – L.D. Landau and E. M. Lifshitz

Paper 5

MATHEMATICAL PHYSICS - II

Semester II

Unit I
Differential equations
Ordinary differential equations- Wronskian method – series solutions and the behavior of series solutions - Second order linear differential equations –Power series – Sturm-Liouville theory-applications.

Unit II
Special functions: Series solutions – Generating functions – Rodrigues' formula – recurrence relations and orthogonality properties for Bessel, Legendre and Hermite polynomials.
Applications: (1) Multipole expansion in electrostatics (Legendre polynomials)
(2) Partial wave analysis in plane wave expansion in quantum mechanics (Bessel function) (3)orthogonal properties of the eigen functions of one dimensional harmonic oscillator using generating function

Unit III
Integral transforms
Laplace transforms and inverse Laplace transforms – solution of linear differential equations with constant coefficients - evaluation of integrals-Fourier transforms – Fourier sine and cosine transforms-Convolution theorem – simple applications.
Applications: Solving partial differential equations like (1) heat flow equation (2) wave equation (3) damped and undamped forced vibrations of a harmonic oscillator.

Unit IV
Group theory: Groups, cyclic groups, subgroups, cosets, permutation group, multiplication table, conjugate element and class structure, factor groups and invariant subgroups, isomorphism and homomorphism - representation of a group – Reducible and irreducible representations – Schur's lemmas – Great orthogonality theorem – character table – Simple applications to molecular vibrations.
Applications: Predicting the number of rotational and vibrational modes of molecules (1) linear CO_2 molecule (2) non-linear H_2O molecule (3) predicting the number of rotational and vibrational modes of NH_3

Unit V
Numerical Techniques
Newton-Raphson method - Least square curve fitting technique- Runge-Kutta method - Simphzon rule - Simphzon rule - Traphizoidal rule: Applications to second-order differential equations.

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BOOKS FOR STUDY

1. Mathematical physics – B. D. Gupta, Vikas Pub. Co. Pvt. Ltd
2. Mathematical physics – Sathya Prakash, Kedar Nath and Ram Nath
3. Advanced engineering mathematics – Erwin Kreyszig, 8th Ed. Wiley, NY, 1999.
4. Engineering Mathematics – Vol. I and V – M. K. Venkataraman, The National publishing company, Madras
5. Matrices and Tensors – A. W. Joshi, Wiley Eastern Ltd.
6. Group theory for Physicists - A. W. Joshi, New Age International, New Delhi, 1997.
7. Mathematical physics – P.K. Chattopadhyay, Wiley Eastern, Madras, 1990.
8. Differential Equation-semen's.

BOOKS FOR REFERENCE

1. Matrices (Schaum's series) – Frank Ayres M.
2. Laplace Transforms (Schaum's series) – M.R. Spiegel
3. Mathematical physics – Eugene Butkov, Addison – Wesley, Reading, MA, 1968
4. Higher mathematics for engineering and science – DR. M.K. Venkataraman, The National publishing company, Madras
5. Applied mathematics for engineers and physicists – Pipes and Harvil, Tata Mc Graw Hill
6. Advanced engineering mathematics – M.D. Green Berg, 2nd Ed. International Ed., Prentice-Hall of India Pvt. Ltd. NJ, 1998
7. Chemical application of group theory – F.A Cotton

Paper 6

QUANTUM MECHANICS - I

Semester II

Subject code: 17P2PH 6
Hours/week: 5
Credits: 5
Max. Marks: 75

Unit I
Basic Formalism: Interpretation and conditions on the wave function – postulates of quantum mechanics – Expectation values of dynamical variables -Schrödinger equation for a free particle – Ehrenfest's theorem – stationary states – Hermition operators for dynamical variables – Eigen values and eigen functions – Uncertainty principle-applications.

Unit II
General Formalism: Hilbert space – Dirac's Bra&Ket notation – Representation theory – Coordinate and momentum representation – Time evolution – Schrödinger and Heisenberg interaction pictures – Symmetries and conservation laws – Unitary transformations associated with translations and rotations – Parity and time reversal.

Unit III
1D and 3D Problems: **1D**: Boundary condition at the surface of infinite potential – energy levels for 1D square-well potential of finite depth– finite potential barrier (tunnel effect) – Quantum theory for a single step potential barrier. **3D**: particle in a box-hydrogen atom-3D square well potential – 3D harmonic oscillator- Orbital angular momentum and spherical harmonics- free particle in spherical polar coordinates.

Unit IV
Angular Momentum and Identical Particles: Angular momentum in quantum mechanics – commutation rules for angular momentum operators– Ladder operators – allowed values of j and m -matrix elements of angular momentum operators – construction of angular momentum matrices - Pauli's spin matrices-addition of angular momenta – Clebsch-Gordan coefficients.

Unit V
Approximation Methods: WKB approximation – WKB quantization rule – applications to bound states and Heitler-London theory of hydrogen molecule.
Time-independent perturbation theory: non-degenerate case-normal Helium atom (without spin) - degenerate case - first order Stark effect in Hydrogen atom – The Variation method – application to Ground state of Helium.

Books for study:

1. A Textbook of Quantum mechanics - P.M. Mathews and K. Venkatesan, Tata McGraw Hill, 2005.
2. Quantum Mechanics – V. Devanathan, Narosa, 2006.
3. Quantum Mechanics – S.L Gupta, V.Kumar, H.V. Sharma and R.C. Sharma, Jaiprakasan Nath and Co., 25th ed., 2005.
4. Quatntum Mechanics with applications – Sathya Prakash, Swati Saluja, Kedar Nath and Ram Nath, 2002.
5. Quantum mechanics – V. K. Thangappan, New Age, 2nd ed., 2005.
6. Quantum mechanics – Chatwal Ananad, Himalaya Publications, 4th ed., 2004.
7. Advanced Quantum mechanics – Sathya Prakash, Kedar Nath and Ram Nath, 5th ed., 2005.
8. Introduction to Quantum mechanics - A. Ghatak, Macmillan India, New Delhi, 2002.
9. Quantum mechanics, Theory and applications - A. Ghatak and S. Lokanathan, Macmillan India, New Delhi, 5th ed, 2005
10. Quantum mechanics – G. Aruldhas, Prentice Hall of India, New Delhi, 2006.

Books for reference

1. The Feynman Lectures on Physics – R.P. Feynman, R.B. Leighton and M. Sands, Vols. 1,2 and 3, Narosa Publishing House, New Delhi, 1988.
2. Quantum mechanics– L. I. Schiff, 3rd edition International students' edition.
3. Quantum mechanics – E. Merzabacher, Wiley international edition.
4. Quantum mechanics – J. L. Powell and B. Crasemann, Narosa Publications.
5. The principles of Quantum mechanics - P. A. M. Dirac.
6. Quantum mechanics – L.D. Landau and E.M. Lifshitz.
7. Quantum mechanics – S. N. Biswas, Books and Allied Ltd., Kolkatta 1999.
8. Basic Quantum mechanics – A. Ghatak, Macmillan India, New Delhi, 2002.
9. Introduction to quantum mechanics – D.J. Griffiths, 2006.
10. Advanced quantum mechnics – B.S. Rajput, Pragathi, 6th ed., 2004.

Paper E2

LASER & FIBER OPTICS

Semester II

Subject code: 17P2EPH2
Hours/week: 5
Credits: 4
Max. Marks: 75

Unit I

Laser characteristics: Interaction of light with matter - Spontaneous and Stimulated Emission - Properties of Laser Beams-, Non-radiative delay- 3&4-level lasers, characteristic equation - laser construction: lasing medium, reflectors, Need for resonators – types of resonators – Fabrey-Perot resonator – resonator modes – longitudinal mode – quality factor – cavity finesse –transverse mode – Gaussian beam – Q-switching – mode locking.

Unit II

Solid state lasers – Nd:YAG – colour center laser – liquid laser – dye laser – gas lasers – He:Ne laser – CO_2 laser – excimer laser – semiconductor laser – quantum well laser –free electron laser. Applications: laser diodes, optical communication, Thermonuclear Fusion, Holography, Military.

Unit III

Optical fiber waveguides: Optical fibers – basic structure – Ray theory transmission: total internal reflection, acceptance angle, numerical aperture and skew rays – step index and graded index fibers – single and multi-mode fibers - V-parameter.

Transmission characteristics of optical fibers: Attenuation – absorption, linear and nonlinear scattering losses – intramodal and intermodal dispersion – overall fiber losses in multimode and single-mode fibers. Mitigations to attenuation – repeaters – semiconductor optical amplifier – Erbium doped fiber amplifier – fiber Raman amplifier –dispersion compensating fiber – fiber Bragg grating – photonic crystal fiber.

Unit IV

Fabrication and connection of optical fibres: Liquid-phase (melting): r.f. induction furnace, fiber drawing, stratified melt process and double crucible method, Vapour-phase deposition techniques: OVPO, MCVD and PCVD – stability of the fiber transmission characteristics: micro bending and hydrogen absorption – fiber alignment and joint loss – fiber splices – fiber connectors: cylindrical ferrule expanded beam connectors – GRIN rode lenses - fiber couplers: three and four port couplers, star couplers.

Unit V

Nonlinear effects in fiber and solitons in optical fiber communication: Harmonic generation – intensity dependent refractive index – second harmonic generation (SHG) – factors influencing SHG - Kerr effect – stimulated Raman scattering – stimulated Brillouin scattering – self-steepening – self-focusing – self-defocusing – concepts of solitons – formation of solitons – Non linear Schrödinger equation of solitons - soliton as carrier – merits of soliton based communication system – soliton switching – soliton laser.

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Books for study:

1. Introduction to fiber optics, Ajoy Ghatak and K. Thyagarajan, Cambridge University press, 6th ed., 2006.
2. Optical fiber communications: Principles and practice, John M. Senior, PHI, 2nd edition.
3. Fiber-Optic communication systems, Govind P. Agrawal, John Wiley, 2003.
4. Waves called solitons: concepts and experiments, Springer Verlag, 1992.

Books for reference:

1. Optical fiber communications, Gerd Keiser, McGra-Hill, 2nd edition.
2. Lasers and Non-Linear optics, B.B. Laud, New Age International, New Delhi.
3. Solitons in optical communications, Akira Hasegawa and Yujiodama,, Oxford Press, 1995.
4. Nonlinear fiber optics – Robert W Boyd, Elseivier, 2nd ed., 2006.

Paper 7

GENERAL EXPERIMENTS - PRACTICAL – I
(Any 10 experiments only)

Semester II   Subject code: 17PPHPR1
                                                          Hours/week: 5
                                                             Credits: 5
                                                        Max. Marks: 60

1. Determination of Young's modulus by elliptic fringes – Cornou's method.

2. Determination of Young's modulus by hyperbolic fringes – Cornou's method.

3. Co-efficient of viscosity of liquid – Mayer's oscillating disc method.

4. Compressibility of a liquid using Ultrasonic Interferometer.

5. Determination of Stefan's constant.

6. Temperature co-efficient of thermistor.

7. Thickness of insulation of a wire by diffraction / interference method.

8. F. P. Etalon using spectrometer.

9. Hydrogen spectrum - Rydberg's constant

10. Solar spectrum - Hartmann's interpolation formula - determination of wavelengths of Fraunhofer lines.

11. Copper arc spectrum using Constant Deviation Spectrograph

12. Iron arc spectrum using Constant Deviation Spectrograph

13. Brass / Alloy arc spectrum

14. Determination of specific charge of electron – Magnetron method.

15. Electrical resistance of a metal / an alloy by four-probe method – as a function of temperature.

16. Opto Electronic properties –

    a. Light Emitting Diode (LED)

    b. Photo Diode

    c. Photo Transistor

    d. Solar Cell

    e. Light Dependent Resistor (LDR)

BOOKS FOR REFERENCE

1. An advanced course in practical Physics,– D.Chattopadhyay, P.C. Rakshit and B. Saha, 6th Ed., Books and Allied, Kolkatta, 2002.

2. M.Sc. Practical Physics, Philomin Raj

Paper 8

ELECTRONICS EXPERIMENTS - PRACTICAL – II
(Any 20 experiments only)

Semester II

Subject code: 17PPHPR2
Hours/week: 5
Credits: 5
Max. Marks: 60

1. Regulated powers supply – 5Volt digital, 12-0-12V for OPAMP experiments.

2. V- I characteristics of UJT and UJT as relaxation oscillator.

3. V- I characteristics of JFET.

4. Design of common source FET amplifier and its frequency response.

5. V- I characteristics of MOSFET.

6. V- I Characteristics of SCR.

7. Half-adder and half-subtractor using NAND/NOR gates.

8. Full-adder and full-subtractor using NAND/NOR gates.

9. Study of *R-S*, clocked *R-S* and *D* flip-flops using NAND/NOR gates.

10. Study of Master-Slave flip-flops using NAND and NOT gates.

11. *J-K* and *D* flip flops using IC 7476/IC 7473.

12. 4 bit shift registers

13. Design of counters: Synchronous, asynchronous, ring and Johnson counters.

14. Study of Multiplexers and demultiplexers.

15. IC 7490 as modulus counter and display using IC 7447.

16. Operational amplifier – Summing, difference, averaging, logarithmic, anti logarithmic Integrator and differentiator amplifiers –.

17. Operational amplifier – analog computation – solving simultaneous linear and 2nd order differential equations.

18. Study of the attenuation characteristics of phase-shift and Wien-bridge networks.

19. Operational amplifier – Design of phase-shift oscillator and Wien-bridge oscillator.

20. Operational amplifier – square wave, saw-tooth wave and triangular wave generators.

21. Operational amplifier – Design of Schmitt trigger and construction of mono-stable multivibrator.

22. Operational amplifier – Design of Butterworth low pass, high pass, band pass, band reject and multiple feedback design for band pass.

23. Operational amplifier – Design of digital to analog converter – R-2R ladder network and weighted resistor network.

24. 555 timer – Astable & monostable multivibrators,

25. 555 timer - Schmitt trigger, voltage controlled oscillator and frequency divider.

BOOKS FOR REFERENCE

1. An advanced course in practical Physics,– D.Chattopadhyay, P.C. Rakshit and B. Saha, 6th Ed., Books and Allied, Kolkatta, 2002.

2. M.Sc. Practical Physics, Philomin Raj

PAPER 9

SPECTROSCOPY

Semester III

Subject code: 17P3PH7
Hours/week: 5
Credits: 5
Max. Marks: 75

Unit I

Microwave Spectroscopy: Pure rotational spectra of diatomic molecules – Linear and Symmetric top molecules – Stark effect.

IR Spectroscopy: Vibrational spectroscopy of diatomic molecule– IR Spectrophotometer – interpretation of vibrational spectra – group frequencies- identification of molecular constituents and transition phases of ceramics by FTIR techniques.

Unit II

UV-VIS and Mossbauer spectroscopy:

UV-VIS: Formation of electronic spectra – electronic transition – Frank-Condon principle – intensity distribution in absorption bands - electronic spectra in emission and absorption.

Mossbauer spectroscopy: Mossbauer effect-Recoilless emission and absorption-interpretation of Mossbauer spectrum-Experimental method- Mossbauer spectrometer-Hyperfine interaction-Chemical shift and isomeric shifts-structure determination.

Unit III

NMR & NQR spectroscopy:

NMR: Principle and origin of NMR – Bloch equations – Steady state solution of Bloch equation – Theory of chemical shifts – relaxation process - Single coil method – interpretation of NMR spectrum of propane, ketone and benzene group.

NQR: Theory and instrumentation – Nature of chemical bond – study of chloromethane and charge transfer compounds.

Unit IV

Raman & Electron Spin Resonance spectroscopy:

Raman: Theory-mathematical explanation of stokes and antistokes lines‑ Raman spectrometer – identification of a compound – structural investigations.

ESR: Quantum mechanical treatment of ESR – Nuclear interaction and hyperfine structure – Relaxation effects – ESR spectrometer – ESR spectra of free radicals in solution – splitting of states and transition.

Unit V

Surface Spectroscopy: Electron energy loss spectroscopy (EELS) – Reflection-Absorption – IR Spectroscopy (RAIRS) Inelastic Helium Scattering – Photoelectron Spectroscopy (PES) – X-ray (XPES) – Ultra-Violet (UPES) – Auger Electron Spectroscopy (AES).

Book for Study:

1. Fundamental of Molecular Spectroscopy - C.N. Banwell and E.M. Mc Cash, 4th Ed ,Tata McGraw Hill, New Delhi, 2005.
2. Spectroscopy – Gurdeep Chatwal and Anand, Himalaya Publishers.
3. Elements of Spectroscopy – Gupta, Kumar, Sharma , Pragati Prakasan. 19th ed., 2006.
4. Molecular Structure and Spectroscopy - G. Aruldhas, Prentice Hall of India,2005
5. Basic Principle of Spectroscopy, - Raymond Chang McGraw Hill Kogakusha Ltd.

Book for reference:
1. Introduction to Atomic Spectra - H.E. White, McGraw Hill Kogakusha Ltd.
2. Atomic and Molecular Spectroscopy - M.C. Gupta, New Age International, New Delhi, 2001
3. Spectroscopy Vol. I & II - Walker and Straw, Chapman and Hall, 1967.
4. Spectroscopy – H. Kaur, 2nd edition, Pragati Prakasan, Meerut, 2005.
5. The Feynman Lectures on Physics Vol. I, II & III - R.P. Feynman, R.B. Leighton, and M. Sands, Narosa, New Delhi, 1998.

QUANTUM MECHANICS - II

Semester III   Subject code: 17P3PH 8
                                                                        Hours/week: 5
                                                                            Credits: 5
                                                                       Max. Marks: 75

Unit I
Scattering Theory: Scattering amplitude – Cross sections – Born approximation – condition for validity – phase-shift – Partial wave analysis – effective range theory for S-wave – transformation from centre of mass to laboratory frame.

Unit II
Perturbation Theory: Time dependent perturbation theory – Constant and harmonic perturbations – Transition probabilities – Fermi-Golden rule - selection rules for dipole radiation – adiabatic approximation – Sudden approximation – The density matrix – Spin density matrix and magnetic resonance – Semi-classical treatment of an atom with electromagnetic radiation.

Unit III
Relativistic Quantum Mechanics: Klein-Gordon equation – failures of K-G equation - Dirac equation – plane-wave solutions – Interpretation of negative energy states – Antiparticles – Spin of an electron – magnetic moment of an electron due to spin – Energy values in a coulomb potential.

Unit IV
Dirac equation: Covariant form of Dirac equation – Projection operators for energy and spin - properties of the gamma matrices – Traces – Relativistic invariance of Dirac Equation: Hydrogen atom – Feynman's theory of positron (Elementary ideas only).

Unit V
Second Quantization: Second quantization of Klein-Gordon field – Creation and Annihilation Operators – Commutation Relations - Quantization of Electromagnetic Field - Creation and Annihilation Operators – Commutation Relations – quantization of Schrödinger field.

Books for study:

1. Quantum mechanics, Sathyaparakash, Kedarnath Ramnath & Co. , Meerut.
2. Introduction to quantum mechanics, Gupta Kumar and Sharma, Kedar Nath and Ramnath Co. Meerut, 1994.
3. Quantum Mechanics, V.K.Thankappan, New Age internation Pvt. Ltd., New Delhi.
4. Quantum mechanics, G. Aruldas, Prentice Hall of India, New Delhi, 2006.

Books for Reference:

1. Quantum mehanics, L. Schiff, Mc Graw-Hill book Co., New York, 1996.
2. Quantum Mechanics, V. Devanathan, Narosa , 2006.
3. A Text book of Quantum Mechanics , P.M.Mathews and K.Venkatesen, Tata Mcgrw Hill.
4. Quantum Mechanics, Chatwall and Anand, Himalaya publishing house, New Delhi, 1993.

Paper 11

PHYSICS OF MATERIALS – I

Semester III

<div style="text-align: right">

Subject code: 17P3PH 9
Hours/Week: 5
Credits: 5
Max. Marks: 75

</div>

UNIT I
CRYSTAL STRUCTURE AND BONDING

Crystal systems - Bravais lattices –coordination number – packing factors – Cubic, hexagonal, diamond structure, Sodium Chloride Structure – Miller Indices – inter planar spacing – directions. Reciprocal lattice and Brillouin zone-Bragg-Laue formulation of X-ray diffraction by a crystal; Atomic and crystal structure factors; Experimental methods of X-ray diffraction: Laue, rotating crystal and powder method; Types of bonding – cohesive energy- lattice energy - Madelung constants – Born Haber cycle.

UNIT II
LATTICE DYNAMICS

Mono atomic and diatomic lattices – anharmonicity and thermal expansion- phonon – Momentum of phonons, Inelastic scattering of photons by long wavelength phonons, Local phonon model – Einstein and Debye model, Thermal conductivity of solids- due to electron-due to phonons – thermal resistance of solids – phonon-phonon interaction-normal and Umklapp processes - scattering experiments.

UNIT III
FREE ELECTRON THEORY

Drude theory – Wiedemann-Franz Law and Lorentz number –Quantum state and degeneracy density of states - free electron statistics (Fermi-Dirac), Fermi energy and electronic Specific heat, Electrical conductivity of metals – Boltzmann transport theory – electrical and thermal conductivity of electrons.

UNIT IV
PERIODIC POTENTIALS AND ENERGY BANDS

Bloch's theorem – Kronig-Penney model-Construction of Brillouin Zones-Effective mass of electron-nearly free electron model – Tight binding approximation-Construction of Fermi Surfaces - density of states curve-electron, holes and open orbits-Fermi surface studies-Cyclotron resonance, classification into metals, insulators and semiconductors.

UNIT V
SEPERCONDUCTIVITY

Superconductivity – critical parameters – Heat capacity, energy gap and isotope effect - Meissner effect – type I and II superconductors - London theory, Ginsburg- Landau theory and BCS theory – Flux quantization; a.c. and d.c. Josephson effect; Vortex state (qualitative discussions); Josephson junctions and tunneling – SQUID – cryotron - High temperature superconductors - applications. Super fluidity and quantum fluids.

Books for study

1. Introduction to solid state physics, C. Kittel, 7th Ed., Wiley, New York, 1996.
2. Solid state Physics, Saxena Gupta Saxena, Pragati Prakasan, Meerut.
3. Solid state Physics, R.L. Singhal, Kedar Nath , Meerut.
4. Solid state Physics, Gupta and Kumar, KedarNath , Meerut.

Books for reference

1. Introduction to solids, L. Azaroff, Tata McGraw Hill Co. 1997.
2. Introductory Solid state Physics, H.P. Myers, 2nd Ed. 1998.
3. Solid state physics, J S Blakemore, Saunder's company 1974.
4. Solid state physics, A J Dekker, Macmillan, India 1985.
5. Elementary Solid state Physics - Principles and applications M. Ali Omar, Addison-Wesley, 1974.
6. Solid state Physics, N.W. Aschroft and N.D. Mermin, Rhinehart and Winton, New York.

MICROPROCESSORS 8086 AND MICROCONTROLLERS 8051

Semester III   Subject code: 17P3EPH 3
Hours/Week: 6
Credits: 4
Max Marks: 75

Unit I

Interfacing 8085: 8-bit Microprocessors – Interfacing 2kX8, 4kX8, ROM and RAM Interfacing - 8255 interface - LED interface – Traffic signal control – Stepper motor control interface – Hex key board interface 8279 – 8155 Timer interface – USART - ADC And DAC interface.

Unit II

Architecture of 8086: Internal architecture of 8086: Bus Interfacing Unit and Execution Unit – Addressing modes– instruction execution timing – Minimum mode and maximum mode systems and their respective signals – Interrupts: interrupt mechanism, types and priority – interrupt vector table – interrupt instructions.

Unit III

Assembler language and Programming of 8086: Instruction set: Data transfer, arithmetic, branch, loop, flag manipulation, compare, logical, shift, rotate instructions and string instructions - Hardware organization of memory address space – Interfacing 4k/8k word – ROM and RAM interface.

Unit IV

Advanced Microprocessors and operating systems: Architecture: software and hardware model of 80386 – Introduction to Pentium Processors - multi tasking concept – comparison of 8086, 80386 and Processors.

Unit V

Micro controllers: Introduction to single chip microcontroller – comparison between microprocessor and micro computers – architecture of 8051 – addressing modes – instruction set -8051 micro controller hardware, input/output pins, ports, external memory, serial data i/o, interrupts– arithmetic and logical program only.

Books for study

1. Microprocessor Architecture, Programming and Application with 8085, R.S. Gaonkar, Penran International Publishing, 1997.
2. Fundamentals of Microprocessors 8085 – Architecture, Programming (MASAM) and interfacing, V. Vijyaendran, Viswanathan, Chennai.
3. Fundementals of Microprocessors and Microcomputers, B. Ram, Dhanpat Rai Publications, New Delhi.
3. Fundamentals of Microprocessors 8086 – Architecture, Programming (MASAM) and interfacing, V. Vijyaendran, Viswanathan, Chennai.
4. Microprocessors & Interfacing – Programming & hardware By D. V. Hall, Tata
   McGraw Hill.
5. The 8088 AND 8086 microprocessors By Walter A. Tribel & Avtar Singh, Prentice
   Hall of India.
6. The Intel Microprocessors 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium processor and Architecture, programming and interfacing, Barry B. Brey, Prentice Hall of India,

Books for reference

1. Microprocessors, Gilmore, Tata Mc Graw Hill.
2. Microprocessors Interfacing, Programming and Hardware, Douglas V. Hall, Tata McGraw Hill.
3. Microcomputers Systems: The 8086/8088 Family Architecture, Programming and Design, Yu-Cheng Liu, Glenn A. Gibson.
4. The 8086/8088 – Design, Programming and Interfacing, J. Uffenbeck. Prentice-Hall of India.
5. The 8051 Microcontroller: Architecture, programming and applications By Kenneth
   J. Ayala, Penram International
6. The 8051 Microcontroller and Embedded Systems By Mazidi & Mazidi, Prentice   Hall
   of India,

Paper 12

NUCLEAR AND PARTICLE PHYSICS

Semester IV
Subject code: 17P4PH 10
Hours/week: 5
Credits: 5
Max. Marks: 75

Unit I
Nuclear interactions: Nucleon–nucleon interaction: ground state of deuteron – exchange forces and tensor forces - meson theory of forces – Yukawa potential – nucleon-nucleon scattering (low energy) – effective range theory – spin dependence, charge dependence and charge symmetry of nuclear forces – isospin formalism.

Unit II
Nuclear reactions: Types of reactions and conservation laws – energetics of nuclear reactions – reaction dynamics – Q-value equation – scattering and reaction cross sections – scattering matrix – Reciprocity theorem - compound nucleus reactions – direct reactions – Breit-Wigner one-level formula - resonance scattering.

Unit III
Nuclear models: Liquid drop models – Bohr-Wheeler theory for fission – Shell model – spin-orbit coupling – spins of nuclei - Magic numbers – Angular momenta and parity of nuclear ground states – qualitative discussion and estimates of transition rates – magnetic moments and Schmidt lines – collective model of Bohr and Mottelson.
Unit IV
Nuclear decay: Beta decay – energy release in beta decay - Fermi theory of beta decay – shape of the beta spectrum – total decay rate – mass of the neutrino – angular momentum and parity selection rules – allowed and forbidden decays – comparative half-lives – Neutrino physics – non-conservation of parity – gamma decay – multipole transitions in nuclei – angular momentum and parity selection rules – internal conversion – nuclear isomerism.

Unit V
Elementary particles: Interaction between elementary particles – Classification - Hadrons and leptons – symmetry and conservation laws – Elementary ideas of CP and CPT invariance – Symmetric rules SU(2) & SU (3)- Quark model – Gell-Mann-Okuba mass formula of octets and decouplet hadrons – Weak interaction of hadrons and leptons – Universal Fermi interaction.

Books for study:

1. Introductory Nuclear Physics, K. S. Krane, Wiley, Newyork, 1987.
2. Nuclear Physics, R.R. Roy and B.P. Nigam, Wiley, Newyork, 1983.
3. Nuclear Physics, V. Devanathan, Narosa, 2005.
4. Nuclear Physics, Pandya and Yadav
5. Introduction to elementary particles, D. Griffiths, Harper and Row, Newyork, 1987.

Books for reference:

1. Introduction to Nuclear Physics, H.A. Enge, Addison-Wesley, 1975
2. Nucleon-Nucleon interaction, G.E. Brown and A.D. Jackson, North-Holland, Amsterdam, 1976.
3. Introductory Nuclear Physics, Y.R. Waghmare, Oxford IBH, Bombay, 1981.
4. Elementary particles, J.M. Longo, McGraw-Hill, New York, 1971.

Paper 13

PHYSICS OF MATERIALS – II

Semester IV

Subject code: 17P4PH11
Hours/Week: 5
Credits: 4
Max Marks: 75

Unit I
SEMICONDUCTORS

Effective mass of electron and holes - Energy band formation – E-K diagram -direct and indirect gaps – Variation of Fermi level with respect to temperature and carrier concentration in intrinsic and extrinsic semiconductors; carrier mobility in semiconductor, Drift and diffusion of carriers - Hall effect in semiconductors – generation, recombination and injection of carriers - law of mass action– electrical conductivity and its temperature variation - III-V and II-VI compound semiconductors.

Unit II
SOFT MATERIALS

Colloids- Interparticle interaction and stabilization-Effective interaction and DLVO theory- Structure and phase behaviour- Dynamics- aggregation-Rheology-Liquid crystal: Classification by symmetry- Nemotes and chlosterics- semectics and columnar phases- phases transition. Amphiles-micelles, bilayer and vesicles-Langmier monolayer micro emulsion membranes. Polymers-polymerisation mechanism-polymers structure- deformation of polymers- behaviour of polymers.

Unit III
DIELECTRIC PROPERTIES

Dielectric constant and polarizability - electronic and ionic polarization of molecules, orientational polarization, static dielectric constant of gases; Lorentz internal field; Static dielectric constants of solids; Complex dielectric constant and dielectric losses, relaxation time; Classical theory of electronic polarization and optical absorption - Internal electric field in a dielectric - Clausius- Mossatti equation - dielectric loss - ferroelectric – types and models of ferroelectric transition - electrets and their applications – piezoelectric and pyroelectric materials. Ferroelectricity - dipole theory case of $BaTiO_3$.

Unit IV
MAGNETIC PROPERTIES

Origin of magnetism; Diamagnetism: quantum theory of atomic diamagnetism; Landau diamagnetism (qualitative discussion); Paramagnetism: classical and quantum theory of paramagnetism; case of rare-earth and iron-group ions; quenching of orbital angular momentum; Pauli paramagnetism; Ferromagnetism: Curie-Weiss law, temperature dependence of saturated magnetization, Heisenberg's exchange interaction, ferromagnetic domains; Ferrimagnetism and antiferromagnetism. - magnetoresistance - GMR materials - dilute magnetic semiconductor (DMS) materials.

Unit V
SOLID STATE IONICS
Concept of solid state ionics- Importance of super-ionic materials and structures-Classification of Superionic solids- Experimental probes pertaining to solid state ionics-Theoretical models of fast ion transport- Applications of fast ionic solids-Hydrogen storage materials- preparation and abrication- -characterization of Li-ion cells-Applications of Lithium batteries in electronic devices, electric vehicle, fuel cells, sensors -Solar energy conversion devices..

Books for study

1. Solid state Physics, revised Sixth edition, S.O.Pillai, New Age International (P) Ltd, 2007.
2. Introduction to Solid state Physics, C. Kittel, Prentice-Hall of India.
3. Materials Science and Engineering, V. Raghavan, Prentice-Hall of India, New Delhi, 1998.
4. Materials Science, Vijaya and Rajarajan, Tata MacGraw Hill.
5. Materials Science, V. Arumugam, anuradha Publications.

Books for Reference

1. Principles of Electronic Materials and devices, S.O. Kasap, Second edition, Tata McGraw-Hill, 2002.
2. Materials Science for Engineers, Van Vlack L, Addison Wesley, 1995.
3. Solid State Physics, N. W. Ashcroft and N. D. Mermin
4. Introduction to Solid State Physics, C. Kittel, Addison wesly
5. Optical Electronics, A.K.Ghatak and Thyagrajan , Cambridge Univ. Press,1989.

Paper E3

NANO PHYSICS

Semester IV   Subject code: 17P4PH11
                                                                          Hours/Week: 5
                                                                          Credits: 4
                                                                          Max. Marks: 75

Unit I
Introduction To Nanomaterials: Classification of Nanomaterials – Melting point – Eutectic temperatures of alloys – Principles of Top-Down and Bottom-Up approaches- Chemistry of nanoparticles synthesis – Nucleation and growth of Nanoparticles - Direct and Indirect Band gap - Different recombination (Band gap) models for light emission - Various luminescence models and its origin – Classification of porous structure.

Unit III
Synthesis And Processing Of Nanomaterials: Synthesis of metallic and semiconductor nanoparticles – Physical and Chemical technique: Ball milling – Laser ablation – RF sputtering - X-ray lithography – Molecular Beam Epitaxy (MBE) – Physical Vapour Deposition (PVD) – Plasma arching – Chemical Vapour Deposition (CVD) – Sol Gel techniques.

Unit III
Fabrication of Nanostructured Materials: Zero-D, 1D and 2D structures – Nanoparticles dispersed in various matrices – Electro Chemical Etching technique to produce Porous Silicon: formation mechanism, factors affecting porous structure- **Nanowires growth techniques**: Vapour Liquid Solid (VLS) technique– **Carbon Nanotubes**: formation, growth, types and structure – **Nanomanipulation**: Nanolithography – Nanoimprint – Dip-Pen lithography.

Unit IV
Characterisation Of Nanomaterials: Estimation of particles size – XRD, SEM, AFM and TEM - Quantum confinement effect – Surface Plasmon Resonance – Electrical Conductivity – Exitons – Scattering.

Unit V
Applications of Nanomaterials: Nanomaterials application in nanotechnology – Medicine: Drug delivery system – nanoboat – molecular recognition – quantum well and quantum dots – photoelectrochemical cells – photonic crystal and Plasmon waveguides - DNA - chemistry and environment – Energy - Information and communication - Heavy Industry – Consumer goods.

Books for study:

1. Nanotechnology by S. Shanmugam, TBH Edition.
2. Nano- the essential, T. Praddetp, Mc graw hill education, Chennai.
3. Physics and Chemistry of Metal cluster components, De Jongh J, 1994, Kulwer academic publishers, Dordrecht.
4. Nanoscale Materials in Chemistry, Kenneth J. Klabunde, 2001 Wiley & Sons, Publcn.
5. Nanosystems, Dexler E, John Wiley, CNY, 1992.

Paper 14

Practical – II - (General experiments)
(Examination - Six hours)

Semester IV   Subject code:**17PPHPR 3**

Hours/Week: 5
Credits: 5
Max. Marks   : 60

1. GM counter – Characteristics, inverse square law and determination of linear absorption co-efficient of different materials.
2. Michelson Interferometer – Determination of Wavelength, separation of wavelengths and thickness of mica sheet.
3. Hall effect – Study of carrier concentration in semiconducting materials, mobility & conductivity of solids and hall angle.
4. Molecular spectra – ALO band
5. Molecular spectra - CN band
6. Determination of Susceptibility magnetic materials (liquid) by Quincke's method.
7. Determination of Susceptibility magnetic materials (liquid) by Guoy's method.
8. Compressibility of a liquid – using Ultrasonic Interferometer.
9. Determination of dielectric constant of a dielectric material
10. Franck-Hertz experiment – verification of Bohr's postulate and determination of wavelength of the radiation
11. Study of magneto resistance of a semiconducting material – four probe method.
12. Laser experiments
    a. To determine the wavelength of the laser beam
    b. Determination of the power distribution within the laser beam
    c. Determination of laser beam diameter
    d. To measure the divergence of laser beam
13. Fiber Optical Characteristics
    a. To determine the numerical aperture of an optical fiber.
    b. Determination of bending loss in multi mode fiber
    c. Determination of fiber attenuation
14. Spectral analysis of a salt.
15. Absorption Spectra

Books for reference:

1. M.Sc. Practical Physics, Philomin Raj

Paper 15
Practical – II - <small>(Electronics experiments)</small>
<small>(Examination - Five hours)</small>

Experiments using Microprocessor – 8085

1. Clock Program.
2. ADC 0809 interface.
3. Hex keyboard interface.
4. Stepper motor interface.
5. LED interface (single LED ON-OFF – Binary counter, BCD counter, Ring counter and Johnson counter (8-bit).
6. DAC 0800 interface and waveform generation.
7. ADC using DAC and op-amp comparator

Experiments using Microprocessor–8086

8. Arithmetic operations – Addition, subtraction, multiplication, division, square and square root
9. Ascending order/ Descending order.
10. Block transfer using string instructions.
11. ADC 0809 interface.
12. Hex keyboard interface.
13. Stepper motor interface.
14. DAC 0800 interface and waveform generation.

Experiments using Microcontroller – 8051
15. Arithmetic operations – Addition, subtraction, multiplication, division, square and square root
16. Ascending order/ Descending order.
17. Block transfer using string instructions.
18. ADC 0809 interface.
19. Hex keyboard interface.
20. Stepper motor interface.
21. DAC 0800 interface and waveform generation.

Books for reference:

1. R. S. Gaonkar, Microcprocessor Architecture, Programming and Application with 8085, 3rd edition, Penran International Publishing, Mumbai, 1997.
2. B. Ram, Fundamentals of Microcprocessors and Microcomputers, Dhanpat Rai Publications, New Delhi.
3. V.Vijayendran, Fundamentals of Microprocessor-8085 – Architecture, Programming (MASM) and Interfacing, Viswanathan, Chennai, 2002.
4. J.Uffenbeck, The 8086/8088 Family – Design, Programming and Interfacing (Prentice-Hall of India, New Delhi).
1. V.Vijayendran, Fundamentals of Microprocessor-8086 – Architecture, Programming (MASM) and Interfacing, Viswanathan, Chennai, 2002.
2. Douglas V.Hall, Microprocessors Interfacing, Programming and Hardware. Tata McGraw-Hill.

MUTHURANGAM GOVT. ARTS COLLEGE (Autonomous), Vellore-2.

PATTERN OF QUESTION PAPER

M.Sc. – PHYSICS

Time: **3** Hours   Maximum: **75** marks

SECTION – A (5 x 6 = 30marks)
Either or Pattern
Answer **ALL** questions.
All questions carry equal marks.
(One question from each unit).

SECTION – B (3 X 15= 45 marks)
Answer any three out of five
All questions carry equal marks.
(One question from each unit).

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PART I
CORE COURSE I
RESEARCH METHODOLOGY

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PAPER CODE:
MAX. MARKS: 75

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UNIT I: RESEARCH METHODOLOGY

Meaning of research – Objectives of research - motivation of research – Types, approaches and significance – Methods versus methodology - Research in scientific methods – Research process – Criteria for good research – Problem encountered by research in India – Funding agencies.

UNIT II: RESEARCH DESIGN

Research Problem: Selecting the problem – Necessity of defining the problem – Techniques involved in defining the problem – Research design – Needs and features of good design – Different research design – Basic principles of experimental designs.

UNIT III: DATA COLLECTION AND DOCUMENTATION

Data collection methods – Data types – Processing and presentation of data – Techniques of ordering data – Meaning of primary and secondary data – The uses of computers in research – The library and internet – Uses of search engines – virtual libraries – common software for documentation and presentation.

UNIT IV: DATA AND ERROR ANALYSIS

Statistical analysis of data – Standard deviation – Correlation – Comparison of sets of data – Chi squared analysis for data – Characteristics of probability distribution – Binomial, Poison and normal distribution – Principal of least square fittings – Curve fitting – Measurement of errors – Types and sources of errors – Determination and control of errors.

UNIT V: RESEARCH COMMUNICATION

Meaning of research report – Logical format for writing thesis and paper – Essential of scientific report: abstract, introduction, review of literature, materials and methods and discussion – Write up steps in drafting report – Effective illustrations: tables and figures – Reference styles: Harvard and Vancouver systems.

REFERENCE BOOKS:

1. Research methodology, Methods and techniques – C.R.Kothari – Wishwa Prakasam Publications, II Edition.

2. Research: An introduction – Robert Ross – Harper and Row publications.

3. Research methodology – P.Saravanavel – Kitlab Mahal, Sixth Edition.

4. A Hand book of Methodology of research – Rajammal P.A.Devadass – Vidyalaya Press

5. Introduction to Computers – N.Subramanian

6. Statistical methods – G.W.Snedecor and W.Cocharan – Oxford and IBH, New Delhi.

7. Research Methodology Methods and Statistical Techniques – Santosh Gupta.

8. Statistical Methods – S.P.Gupta

9. Scientific social surveys and research – P.Young – Asia Publishers, Bombay.

10. How to write and publish a scientific paper – R.A.Day – Cambridge University Press.

11. Thesis and Assignment writing – Anderson – Wiley Eastern Ltd.

PART I
CORE COURSE II
ADVANCED PHYSICS I

PAPER CODE:
MAX. MARKS: 75

UNIT I: QUANTUM MECHANICS

Second quantization of Schrodinger and Klein-Gordon fields – Creation and annihilation operators – Commutation relations – second quantization of Dirac field – Covariant and anti-commutation relations for Dirac field.

UNIT II : NUCLEAR AND PARTICLE PHYSICS

Compound nucleus and statistical theory – Experimental evidence – Statistical assumption – average cross section – Angular distribution – Transmission coefficients – Level density – Decay of the Statistical compound nucleus – Emission of charged particles. Symmetries and conservation laws – Gell Mann Nishijima formula – CPT invariance-Quark model.

UNIT III : NON-LINEAR AND MOLECULAR MECHANICS

Basics of nonlinearity – Linear and nonlinear oscillators – Autonomous and non-autonomous system – Dynamical systems. The energy calculations – Energy minimization – Force field parameterization – Conformation analysis – Solvation – Montecarlo methods – Molecular dynamics – Free energy calculation.

UNIT IV: SOLID STATE PHYSICS – I

Band structure theory – Band structure of some semiconductors – Semiconductor transport theory – Basics of continuity relation – Theory of generation and recombination – Theory of PN junction – PN junction solar cells – Ionic conductivity – Normal and super ionic conductors – Application of super ionic solids: Battery, Fuel cells, Electro chromic display.

UNIT V: SOLID STATE PHYSICS – II

Basic concepts of dielectrics: Static fields – Time dependent fields – Static dielectric constant: Dipolar interaction – dipolar molecules in gases and dilute solutions – Onsager equation – Debye equation – Dielectric relaxation and loss – Distribution of relaxation time – Complex plane diagrams – Cole-Cole, Cole-Davidson plots.

REFERENCE BOOKS:

1. Advanced Quantum Mechanics – B.S. Rajput – Pragathi Praksan

2. Physics of the nucleus – M.A. Preston –Addison – Wesley

3. Elementary Particles – D.Griffiths.

4. Nonlinear dynamics – M.Lakshmanan and S.Rajasekar – Springer International

5. Computational Chemistry – Guy H.Grant and W. Graham Richards – Oxford University Press

6. Semiconductor Devices – S.M. Sze

7. Electronic properties of materials – Rolf E. Hummel – Springer

8. Super ionic Solids – S. Chandra – North Holland Publishing Company Ltd.

9. Theory of Dielectrics – H.Frohlich – Oxford University Press

10. Theory of electric polarization Vol. I and II – C.J.F. Botcher – Elsevier scientific Publication.

Internal Papers

CRYSTAL PHYSICS

UNIT I – Crystallography

Crystals and their properties – classification – Crystal systems – Bravais space lattices – reciprocal lattice – Ewald sphere – Diffraction of X rays by crystal lattices – Scattering factor – Bragg's law – experimental techniques to solve crystal structures – four circle diffractometer – Goniometer mounting – detectors – structure solutions from collected data – corrections for data.

UNIT II – Growth Mechanism

Theory of Nucleation – Classical theory of nucleation - homogeneous and heterogeneous nucleation – energy formation of spherical non spherical nucleus – critical size and energy of nucleus – nucleation rate – evaluation of free energy of nucleus.

Kinetics of crystal growth – KSV theory –BCF theory – Periodic Bond Chain theory – The Muller – Krumbhaar model.

UNIT III – Growth Techniques

Crystal growth methods – Low temperature solution growth – Super saturation – high temperature solution growth – flux growth – Gel growth – Melt growth – CVD, CVT, PVD techniques – hydrothermal growth – epitaxial growth – LPE & VPE methods.

UNIT IV - Instrumentation

Constant temperature bath for slow cooling - High temperature technology for crystal growth – furnaces – temperature measurement, control, programming – resistance thermometry – thermoelectric thermometry – optical pyrometry – design and fabrication for a crystal puller.

UNIT V - Characterization

Characterization of grown crystals – Structural and optical properties by single/Powder XRD, FTIR, UV analysis – mechanical properties – micro hardness studies – electrical properties by dielectric and photoconductive studies – thermal studies.

BOOKS FOR STUDY:

1. Crystal growth and processes – P.Ramasamy and Santhana Raghavan
2. Solid State Chemistry – Roop R.C. – Elsevier
3. Handbook of analytical instruments – Khandpur R.S. – Tata McGraw Hill
4. Science of the solid state – Edited by Brain Pamplin – Prgamon Press
5. Solid state chemistry and its applications – Antony R.West – Wiley Indian edition.

CRYSTAL GROWTH AND CHARACTERIZATION

UNIT I – Growth Mechanism

Theory of Nucleation – Classical theory of nucleation - homogeneous and heterogeneous nucleation – energy formation of spherical non spherical nucleus – critical size and energy of nucleus – nucleation rate – evaluation of free energy of nucleus.

Kinetics of crystal growth – KSV theory –BCF theory – Periodic Bond Chain theory – The Muller – Krumbhaar model.

UNIT II – Growth Techniques

Crystal growth methods – Gel growth: Liesegang rings - Single diffusion – double diffusion-Low temperature solution growth – Super saturation – high temperature solution growth – flux growth – Gel growth – CVD, CVT, PVD techniques – hydrothermal growth – epitaxial growth – LPE & VPE methods.

UNIT III - Characterization Techniques

Characterization of grown crystals – Structural and optical properties by single/Powder XRD, FTIR, UV analysis – mechanical properties – micro hardness studies – electrical properties by dielectric and photoconductive studies – thermal studies.

UNIT IV - Urinary Stones – A Review

Types of urinary stones – Artificial stones - Causes – Recurrence – Climatic causes – Prevention – Stones in Man and Women – Extra shock wave lithotripsy – Alternate treatment.

UNIT V - Computational Methods and Water analysis

Computational Methods : Ab – initio method – Density functional theory – Molecular mechanics – Basis set formation – Structural Determination – Physiochemical analysis.
Water analysis : BIS and WHO standards - Ground water and surface water analysis - Sampling – Characterization: pH, Total dissolved salts, Colour, odour, electrical conductivity, UV analysis.

BOOKS FOR STUDY:
6. Crystal growth and processes – P.Ramasamy and Santhana Raghavan
7. Solid State Chemistry – Roop R.C. – Elsevier
8. Handbook of analytical instruments – Khandpur R.S. – Tata McGraw Hill
9. Science of the solid state – Edited by Brain Pamplin – Prgamon Press
10. Solid state chemistry and its applications – Antony R.West – Wiley Indian edition.
11. Computational Methods – Erol Lewis
12. Gel growth techniques – Henich.H

Vibrational Spectroscopy

Unit – I: Molecular vibrations and infrared spectroscopy 12hrs
Vibration of diatomic and polyatomic molecules – origin of infrared spectra – Selection rule - Spectral transitions – Internal vibrations – Spectra of simple molecules – Vibrational assignments – Infrared instrumentation- Sources – monochromator – Detectors – Single beam and Double Spectrophotometers – Sampling Techniques – F. T. I.R spectroscopy.

Unit – II : Raman Spectroscopy 12hrs
Nature of Raman effect – Quantum mechanical description – Selection rules – Depolarization ratio – Rotation – vibration spectra – Resonance Raman Effect – Instrumentation – Sample handling techniques- Non linear Raman effects- F.T. Raman Spectroscopy.

Unit – III: Group theoretical applications 12hrs
Groups and their properties – Molecular symmetry – Symmetry elements- Molecular point group- Reducible and Irreducible representations – Great Orthogonality Theorem – Character tables – Normal vibrations – Classification – Selection rules for vibrational transistions – Infrared and Raman Spectral activity

Unit – IV: Normal Coordinate analysis 12hrs
Internal and symmetry coordinates – Kinetic and potential energy matrices – Force constants – Wilson's Secular equation – Factorization and solution – Spectra of isotopic molecules – Approximation methods- Force fields – Normal coordinate analysis of some simple symmetric molecules.

Unit – V: Lattice dynamics and crystal spectra 12hrs
Monoatomic chain – Diatomic chain – Vibrations of three dimensional lattice – Brillouin zones – Dynamical matrix – Crystal spectra – Factor group analysis – Inter atomic forces in solids – Force constants of perovskite fluorides – separation of internal and external vibrations.

References:
1. Banwell C. N., and McCash E. M. Fundamentals of Molecular Spetroscopy, 4th Edition, Tata Mc Graw Hill Co., New Delhi, (Latest Edition).
2. Sathyanarayana. D. N. , Vibrational Spectroscopy – Theory and Applications, New Age International , New Delhi, 1996.
3. Turrell G., "Infrared and Raman Spectra of crystals"; Academic Press, New York 1972
4. Barrow G. M., "Introduction to Molecular Spectroscopy". Tata Mc. Graw Hill Co., New Delhi 1982
5. Wilson E.B.' Decius J.C., and Cross D. C., Molecular Vibrations, Mc Graw Hill, New York 1980.

Preparation and characterization of Nanomaterials

Unit I

Physical Methods: Vapor deposition and different types of epitaxial growth techniques - pulsed - Laser deposition, Magnetron sputtering - RF/DC magnetron sputtering - Micro lithography: photolithography, soft lithography, micromachining, e-beam writing, and scanning probe patterning – laser ablation — microwave plasma evaporation control of grain size-scale up process.

Unit II

Chemical Methods: Sol-gel technique – solvothermal methods-control of grain size – coprecipitation hydrolysis – sonochemical method combustion technique – colloidal precipitation template process – growth of nanorods –solid-state sintering- grain growth. Arc method-carbon nanotubes - other nanotubes and nanorods –nanosprings –rings chemical routes for nanotubes and nanorods – ion beam induced nanostructures.

Unit III

Imaging techniques: Scanning Electron Microscopy: SEM and FESEM -Transmission Electron Microscopy – HRTEM - **Atomic Force Microscopy**: AFM – contact and non-contact mode - Tapping- conducting mode - Near Field Scanning Optical Microscopy; Scanning capacitance - Microscopy- Scanning Microwave Microscope- Magnetic Force Microscopes MFM - Chemical Force Microscope - Applications for analysis of nanomaterials .

Unit IV

Characterization techniques I: Basic principles and applications of UV-Vis, NIR, FTIR, FT-Raman, Photoluminescence, NMR, and Light Scattering methods - Application to nanomaterials characterization.

Unit V

Characterization techniques II: X-ray powder and single crystal diffraction – X-Ray Photoelectron Spectroscopy – EDAX and WDA analysis – EPMA. Quantitative determination of phases - Structure analysis, techniques - structure analysis-profile analysis - particle size analysis using Scherer formula - Auger Electron Spectroscopy - Ellipsometry - Thickness measurements.

Books for Studies:
1. A . Roth, Vacuum Technology North – Holland Pub.,II Edition (1982)
2. H.Gleiter, Progress in Materials Science Vol.33p.223 (1989)
3.The Chemistry of Nanomaterials :Synthesis , Properties and Applications .,
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MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
UNDERGRADUATE SYLLABUS UNDER CBCS

B.SC.,CHEMISTRY SYLLABUS
FOR CANDIDATES ADMITTED FROM 2017-2018 ONWARDS
MARCH-2017

RESOLUTION OF BOARD OF STUDIES IN UNDERGRADUATE COURSE

IN CHEMISTRY

The board of Studies in Undergraduate Chemistry have scrutinised the syllabus for Ist Semester to VIth Semester papers of B.Sc.,Chemistry, Allied chemistry for (B.Sc.,Physics/Maths/Zoology/Nutrition) and non-Major for other degree Course held on the FN of 21-03-2017 and resolved the following

The Board resolved to approve and pass syllabus for undergraduate course on Chemistry for Ist semester to VIth semester theory and practical

Course	: B.Sc. Chemistry	Semester	: 1st semester
Subject	: General Chemistry-I	Batch	: 2017 – 2018 Onwards
Subject code	: 17U1CH1	Credit	: 6

OBJECTIVES:

Basic concepts regarding atomic structure, periodic properties, bonding concepts, quantum chemistry, solids, liquids, gases, hydrocarbons, nomenclature, reactions, principles of volumetric analysis derivation of equations, related problems, applications.

UNIT-I

1.1 Atomic structure: Pauli's Exclusion Principle- Aufbau's principle, Hunds'rule and Electronic configuration of   elements-stability half-filled and completely filled orbital-shapes of s,p,d,and f orbitals. Classification of s, p, d, and f block elements.

1.2 Periodicity of Properties: Definition and periodicity of the following properties-atomic radii, ionic radii. Ionization potential, electron affinity and electronegativity determination of Pauling and Mulliken's scale.

1.3 Types of solvents: protic & aprotic solvents, aqueous solvents-liquid ammonia as a solvent.

UNIT – II

 2.1. Principles of volumetric analysis: Definitions of molarity, molality, normality and molefraction-definition and examples for primary and secondary standards. Theories of acid-base, redox, complexometric, and Iodimetric titrations. Calculation of equivalent weight, Theories of acid – base, redox, metal-ion, Adsorption indicators and choice of indicators.

2.2. Basic concepts of bonding in Organic chemistry: Hybridisation & geometry of molecules – methane, ethane, ethylene, acetylene and benzene. Electron displacement effects – inductive, electromeric, mesomeric,hyperconjugation and steric effects.

2.3. Cleavage of bonds – Homolytic and Heterolytic fission of carbon- carbon bond. Reaction intermediates – Carbocations, Carboanions and Free radicals – structure and stability.

UNIT – III

3.1. Nomenclature of Organic Compounds: IUPAC recommendations for naming aliphatic, alicyclic,aromatic and simple heterocyclic compounds.

3.2. Alkanes: Mechanisms of free radical substitution in alkanes.

3.3. Alkenes: Properties of alkenes – Electrophilic and free radical addition, addition reactions with hydrogen, halogens, hydrogen halide (Markownikoff's rule), Hydrogen bromide (Peroxide effect), Sulphuric acid, water, Hydroboration, Ozonolysis, Hydroxylation with $KMnO_4$, Allylic substitution by NBS.

UNIT –IV

4.1. Quantum Chemistry –Block Body Radiation- Planck's theory – photoelectric effect – Compton effect, De-Broglie's relationship – Heisenberg's Uncertainty principle.

4.2. Schrodinger wave equation (no derivation) – significance of wave functions – normalization - orthogonality of wave functions- radial and angular wave function- probability distribution curve .

4.3. Gaseous state 1 – Gas laws from the kinetic theory of gases – Viscosity – Thermal velocities (no derivation) – mean, rms, most probable. Maxwell's distribution of molecular velocities.

UNIT-V

5.1. Equipartition of energy-Heat capacity – Molecular basis-Virial equation of state- Boyle temperature- Coefficient of compressibility and thermal expansion.

5.2. Liquid state- Surface tension-effect of temperature on surface tension-Parachor-definition and applications only. Viscosity -Effect of temperature and pressure.

5.3. Mesomorphic state-Liquid crystals-Classification and molecular arrangements.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2

MODEL QUESTION PAPER- GENERAL CHEMISTRY-1 (17U1CH1)

SECTION-A (10x2=20)

Answer all questions, all questions carry equal marks

1. State Aufbau's Principle.

2. What are orbits and orbitals?

3. What do you meant by lanthanide contraction?

4. What is hybridization?

5. Glyoxalic acid is stronger than acetic acid? Give reason.

6. What is electromeric effects?

7. State peroxide effects?

8. What is photoelectric effect?

9. What is Compton effect?

10. What are miller indices? Give example.

SECTION –B (5 X 6 = 30)

Answer all questions.

11a. What are the consequence of lanthanide contraction?

11b. Define: Molarity, Molality and Normality.

12a. Compare the stability of primary, secondary and tertiary carbocations.

12b. What are the differences between inductive effect and electromeric effect.

13a. State and explains Markonikoff's rule .

13b. Explain hydroboration.

14b. What are the effects of temperature and pressure and viscosity?

15a. Derive ideal gas equation.

15b. Explain parachor.

SECTION-C (3x10=30)

Answer any three questions, all questions carry equal marks

16. How are the elements classified on the basis of the electronic configuration?

    Mention their properties.

17. Explain the theories of redox and complexometric titrations.

18. Explain the following with suitable example.

        1. Mesomeric effect   (5marks)

        2. Steric effect   (5marks)

19. What is carbocation? Explain the stability of carbocation.

20. Explain the classification and the molecular arrangement in liquid crystals.

Course	: B.Sc. Chemistry	**Semester**	: 2nd semester
Subject	: General Chemistry-II	**Batch**	: 2017 – 2018 Onwards
Subject code	: 17U2CH2	**Credit**	: 6

OBJECTIVES:

To under the basic concepts regarding geometries of molecules.

To learn the chemistry behind Alkali and Alkaline earth metals.

To understand the concepts of Thermodynamics and Wave functions.

UNIT-I

1.1.Chemical bonding-ionic bond: formation and general properties. Radius Ratio Rule and its limitations. Hydration energy and lattice energy and their applications. Born- Haber Cycle. Fajan's Rules.

1.2.Covalent bond:VB theory- formations and general properties, hybridization, sigma and pi-bonds, VSEPR theory and geometries of H_2O, NH_3, CH_4, PCl_5, SF_6, IF_7, BF_3 Molecules, Partial ionic character of covalent bond, percentage of ionic character, hydrogen bonding.

1.3.Molecular orbital theory: Bonding, anti bonding, non-bonding, orbitals and bond order. MO diagram of H_2, He_2, O^{2+}, O^{2-}, and CO. Comparison of VB and MO theories. Types. Examples and effects on properties.

UNIT-II

2.1. Chemistry of S block elements Hydrides, Classification and chemistry of hydrides, Carbides-Preparation and technical applications.

2.2. Alkali metals: Li, Na, K, Rb, Cs. Occurrence, comparative study of elements and their compounds-oxides, halides, hydroxides and carbonates. Exceptional property of lithium. Diagonal relationship between Li and Mg.

2.3. Alkaline earth metals: Be, Mg, Ca, Sr, and Ba. Occurrence, comparative study of elements and their compounds-oxides, halides, hydroxides, sulphates and carbonates. Exceptional property of Beryllium. Diagonal relationship between Be and Al.

UNIT-III

3.1.Alkynes: Acidity of alkynes, formation of acetylides, addition of water with $HgSO_4$ Catalyst, addition of Hydrogen halides and Halogens, Oxidation, Ozonolysis and Hydroboration.

3.2.Dienes: Classification- conjugated, isolated and cumulative-stability and chemical reactivity-1,2 and 1,4 additions- Diels-alder reaction, synthesis of dienes-1,3 butadiene, isoprene and chloroprene.

3.3.Cyclo alkanes: Preparation using Wurtz reaction. Dieckmann's ring closure and reduction of hydrocarbon. Substitution and ring opening reaction. Baeyer's strain theory - theory of strainless rings.

UNIT-IV

4.1. Thermodynamics: Definition and expansion of terms- System, Boundary, Surroundings – Homogeneous and Heterogeneous system- Isolated system- Closed system- Open system - Intensive and extensive properties- State of a system- Independent state variables – Dependent state variables – ThermodynamicFunctions – State and Path functions

4.2. Thermodynamic processes- Types of Processes - cyclic,reversible,irreversible, isothermal and adiabatic.

4.3. Exact and inexact differentials - Concept of heat and work-Zeroth law of thermodynamics.

UNIT-V

5.1. First law of thermodynamics: statement and equation-Cp, Cv relationship- Calculation of W,E and H for the ideal gases under Reversible, Isothermal and Adiabatic condition.

5.2. Joule's Law: Thomson effect- Inversion temperature and its significance.

5.3. Thermo Chemistry: Bond energy- bond dissociation energy- Calculation from thermo chemical data- variation of heat of a reaction with temperature- Kirchoff's equation.

Duration : 3 Hours   **Maximum : 75 Marks**

SECTION-A (10x2=20)

Answer all questions, all questions carry equal marks

1. Define radius ratio rule.

2. State the fajan's rules.

3. What is the bond order of O_2^- ion?

4. Give any one test to explain the acidity to alkynes.

5. What is isolated diene? Give example.

6. What is cyclopropane? Explain its use.

7. State: First law of thermodynamics.

8. Define: Bond Dissociation Energy.

9. Define: Inversion   Temperature.

10. What is acyclic process?

SECTION-B (5x5=25)

Answer all questions, all questions carry equal marks

11a. Explain the Molecular orbital diagram of O_2.

OR

11b. Define lattice energy and explain the determination of lattice energy by Born-   Haber cycle.

12a. Explain the shapes of the molecule NH_3, IF_7, H_2O using VSEPR theory.

OR

12b. Explain H bonding with examples.

13a. Write about 1,4 and 1,2 addition reactions of butadiene.

OR

13b. explain hydroboration with respect to alkynes.

14a. Explain the stability of conjugated dienes

OR

14b. State and Explain Joule-Thomson effect?

15a. Derive: Kirchoff's equation.

OR

15b. Explain the zeroth law of thermidynamics.

SECTION-C(3x10=30)

Answer any THREE questions, all questions carry equal marks

16. Discuss the exceptional properties of lithium.

17.a. Describe the formationof ionic bond with example.   (5 mark)

 b. How will you calculate the percentage of ionic character

   using electronegativity?   (5 mark)

18 a.Explain ionic polymerization with example and suitable mechanism.

 b. Explain ozonolysis of alkyne with example.

19. Derive the relationship between Cpand Cv.

20. Derive the relationship between Delta H and Delta E.

Course	**: B.Sc. Chemistry**	**Semester**	**: 2nd semester**
Subject	**: Chemistry Practical-I**	**Batch**	**: 2017 – 2018 Onwards**
Subject code	**: 17U2CHPR1**	**Credit**	**: 3**

PRACTICAL- I –VOLUMETRIC ESTIMATION

Acidimetry:

1. Estimation of Sodium hydroxide-std. sodium carbonate
2. Estimation of Borax-std. sodium carbonate

Permanganometry:

1. Estimation of oxalic acid- std.Mohrs salt or ferrous sulphate
2. Estimation of Ferrous sulphate - std.Mohrs salt

Iodimetry:

1. Estimation of arsenious oxide.

Iodometry:

1. Estimation of copper-std potassium dichromate
2. Estimation of potassium dichromate- std copper sulphate

Complexometry:

1. Estimation of Zinc / Magnesium using EDTA
2. Estimation of Zinc using ferrocyanide
3. *Estimation of temporary and permanent of water.

Dichrometry:

1. Estimation of ferrous ion using diphenylamine/N-Phenyl anthranilic acid as indicator

Precipitation titration:

1. Estimation of chlorine in neutral medium

SCHEME OF VALUATION FOR PRACTICAL EXAMINATIONS
VOLUMETRIC ANALYSIS

Internal assessment : 25 Marks

External assessment : 75 Marks

Total: 100 marks

Record: 15 Marks

Procedure: 10 Marks

Error upto   2 %   : 50

                2.1 – 3 %   : 40

                3.1 – 4 %   : 30

                4.1 – 5 %   : 20

                  >5 %   : 10

For incomplete or wrong calculation deduct 20 % of total marks scored.

For no calculation deduct 40 % of total marks scored.

For each arithmetic error deduct 1 mark.

Course : B.Sc. Chemistry   **Semester** : 3rd semester
Subject : General Chemistry-III   **Batch** : 2017 – 2018 Onwards
Subject code : 17U3CH3   **Credit** : 3

OBJECTIVES:

 To have an indepth idea of p-block elements & its group study.

 To understand the mechanism of aliphatic nucleophilic substitution reactions and concept of Aromaticity.

 To know the idea of thermodynamics, carnot cycle,carnot thermo,gibbs free energy,Helmholtz free energy, gibbs-helmholtz equation,

UNIT-I

1.1. Principles involved in inorganic qualitative analysis acid, basic radical, eliminating radical - Common ion effect-solubility product-applications of solubility product - spot test reagents for radicals like Al, Ba, Ca, Ni, Sr, Co, Zn.

1.2. Boron family,Electron deficiency and electron acceptor behavior,bonding in diborane.

UNIT-II

2.1.Preparation, properties,uses and structures of Borazole, $NaBH_4$ and $LiAlH_4$.

2.2.Aromatic hydrocarbons and aromaticity - Resonance in benzene - delocalized cloud in benzene. Aromaticity - Huckle's rule (4n+2) rule and its simple applications.

2.3. Electrophilic substitution reactions in aromatic compounds - general mechanisms- nitration, halogenations, sulphonation, Friedel-Craft's alkylation and acylation.

UNIT-III

3.1.Electrophilic substitution reactions - directive influence – orientation - ortho/para ratio -nuclear and side chain halogenations.

3.2.Polynuclear hrydrocarbons. Napthalene and Anthracene - preparation, properties and uses.

3.3.Aliphatic nucleophilic substitution-Mechanisms of SN_1, SN_2 and SN_i reactions. Effects of substrate, solvent, nucleophile and leaving groups.

UNIT-IV

4.1.Second law of thermodynamics - need for the II law, various statements of the second Law.

4.2.Spontaneous processes - Carnot's cycle – efficiency - Carnot's theorems (statements and proof also)

4.3.Concept of entropy. Definition - entropy of an ideal gas - entropy changes in cyclic, reversible and irreversible processes and physical transformations.

UNIT-V

5.1.Calculation of entropy changes with changes in T, V and P-entropy of mixing,

5.2.Gibbs free energy-Helmholtz free energy-their variations with temperature, Pressure and volume - Criteria for spontaneity.

5.3.Gibbs-Helmholtz equations-derivation and applications.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2

**MODEL
QUESTION PAPER-
GENERAL CHEMISTRY-
III (17U3CH3)**

Duration : 3 Hours   **Maximum : 75 Marks**

SECTION-A (10x2=20)

Answer all the Questions

1. What is meant by common ion effect?

2.Explain the electron deficiency behavior of Boron?

3.Explain why Borazole is called as inorganic benzene?

4.Give the mechanism of Sulphonation reaction?

5.How naphthalene is prepared by Haworth's synthesis?

6.Explain the effect of substrate in SN2 reaction?

7.Explain the condition for spontaneity in terms of entropy?

8.Explain why the efficiency of heat engine is always less than unity?

9. Show that the decrease in Gibb's free energy in an isothermal and isochoric process is equal to the net available in that process.

10.Calculate the change in entropy when 28g of nitrogen is expanded from a volume of 2 lit to 10 lit at 298K. Assume nitrogen as an ideal gas

SECTION-B (5x5=25)

Answer all the Questions

All the Questions carry Equal Marks:

11.a. Discuss the position of boron in periodic table.

(or)

11b. Explain the preparation ,properties,uses and structure of $LiAlH_4$ and borozole?

12a.How is $NaBH_4$ prepared? Give its mechanism of action?

(or)

12b.Explain the electrophilic substitution Reaction of n apthalene.?

13a.Describe the orientation of any five functional group of phenol.

.   (or)

13b. What is meant by Aromaticity? Explain Huckel's rule with examples.

14a.Explain SNi reaction with mechanism.

. .   (or)

14b.Describe Friedel-Craft's Alkylation with mechanism.

15a.Derive Gibb's-Helmholtz equation. Give their significance.

.   (or)

15b.Define the concept of entropy using Carnot's cycle.

SECTION-C   (3x10=30)

Asnswer any THREE questions:

16.i). How is Diborane prepared?(2)

   ii).Give the reactions in which it acts as an electron deficient compound.(3)

   iii)Explain the structure of diborane.(5)

17 i)Give the any spot test reagents and its uses.(5)

   ii)Explain the directive influence of the functional groups in the following .

   Nitrobenzene and Cholorobenzene.(5)

18.i) Illustrate the four factors which influence their effects on SN1 reaction.(6)

   ii)Write down the nitration reaction with mechanism(4)

19. Explain the carnot's cycle and derive an expression for the efficiency of a heat engine. (10)

20. i)Derive an expression for the entropy change when the temperature and pressure of an ideal gas changes. (6)

   ii)Calulage the entropy of mixing of 88 grams of carbon dioxide and 2 moles of nitrogen under isothermal and isobaric coditions assuming ideal behavious. (4).

Course : B.Sc. Chemistry   **Semester** : 3rd semester
Subject : Pharmaceutical Chemistry   **Batch** : 2017 – 2018 Onwards
Subject code : 17U3CHSB   **Credit** : 3

OBJECTIVE:-

To Study the importance of drugs and action of drugs in pharmaceutical chemistry.

UNIT-I

1.1. Definition of the following terms: Drug, Pharmachophore, Pharmacology, Pharmacopeia, Bacteria, Virus and Vaccine.

1.2. Causes, Symptoms and drugs for anaemia, jaundice, cholera, malaria and filaria

UNIT-II

2.1. Antibacterials: Sulpha drugs-examples and actions protonsil, sulphathiazole, sulphafurazole- Antibiotics-definition and action of penicillin, streptomycin, chloramphenicol, erythromycein – tetracyclines, structure of chloramphenicol only.

2.2. Antiseptics and disinfectants: Definitions and Examples -phenolic compounds, chloro compounds, cationic surfactants.

UNIT-III

3.1. Indian medicinal plants and uses-tulasi, neem, kizhanelli, mango, semparuthi, adadoda and thoothuvalai.

3.2. Blood: Grouping, composition, Rh factors, blood pressure, hypertension and hypotension.

UNIT -IV

4.1. Analgesics: Definition and actions – narcotic and non narcotic –morphine and its derivatives, pethidine and methadone – disadvantages and uses. Antipyretic , analgesics – salicyclic derivatives, paracetamol ibuprofen.

4.2. Drugs affecting CNS: Definition, distinction and examples for – tranqulisers, sedatives, hypnotic, psychiatric drugs – LSD, and their effects**.**

UNIT-V

5.1.Anaesthetics: Definition – local and general – Volatile – nitrous oxide, ether, chloroform, cyclo propane – Uses and disadvantages – non volatile – intravenous – thiopental sodium, methahexitone.

5.2.Causes, medicines and their mode of action for the treatment of cancer –antineoplastics – diabetes – hypoglycemic agents AIDS-AZT, DDC.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2

MODEL QUESTION PAPER-PHARMACEUTICAL CHEMISTRY (17U3CHSB)

Duration : 3 Hours   **Maximum : 75 Marks**

SECTION-A (10x2=20)

I Answer all the questions. All Questions carry equal marks. (10x2=20)

1.Define pharmacophore?

2.Give to symptoms for jaundice and Malaria?

3.Define Antibiotics. Write down the structure of chloramphenicol?

4.What is disinfectants?

5.Define Analgesics?

6.Define sedatives?

7.Define Rh factor?

8.Explain Blood groupings?

9.What is meant by antiseptics?

10. Give two uses of Thulasi.

SECTION-B (5x5=25)

II Answer any five Questions.

11. (a) Write about anemia due to diminished production of normal red cells?

(or)

(b) What is the difference between Virus and Bacteria?

12.. (a) Explain antiseptics and disinfectants?

(or)

(b) Draw the structure of penicillin and write down the action of penicillin?

13.a) Explain the composition of blood?

(or)

b) Discuss about AIDS control methods?

14.. a) Give the structure and explain the analgesic action of Morphine and Codeine?

(or)

b) Explain about anti pyretic and analgesics?

15.. a). Explain the drugs used for psychitarics?

(or)

b). Explain about the Tranqulizers.

SECTION-C (3x10=30)

III Answer any three questions

16. Write down the causes and symptoms of malaria and filaria?

17. Describe about antibacterial of sulpha drugs with suitable examples?

18. Write note psychiatric drugs?

19. Write a note on Diabetes and how it is controlled?

20. Give two uses of any five Indian medicinal plants.

Course	**: B.Sc. Chemistry**	**Semester**	**: 4th semester**
Subject	**: General Chemistry-IV**	**Batch**	**: 2017 – 2018 Onwards**
Subject code	**: 17U4CH4**	**Credit**	**: 3**

Objective:

To know the halogens and noble gases and its compounds

To understand the mechanisms of elimination reactions.

To know the Phenols, and its important reactions.

To know the idea of partial molar properties, fugacity, activity.

UNIT-I

1.1 Carbon family, Comparison of properties of carbon and silicon - valencies, oxides, halides, hydrides, and oxyacids. Classification, preparation, properties and uses of carbides. Classification of silicates. Chemistry of silicones.

1.2 Halogens. Comparative study of F, Cl, Br, I, and At - elements, reactivites, hydracids, oxides, oxyacids. Interhalogen compounds – BrF_3, ClF_4, IF_5, IF_7 – structure and properties. Pseudohalogens and positive iodine, Fluorides of oxygen. Exceptional properties of Fluorine, Classification of halides.

UNIT - II

2.1. Noble gases, Electronic configurations and position in the periodic table. Applications - Clathrates and compounds of Xenon - hybridization and geometries of XeF_2, XeF_4, XeF_6, $XeOF_4$.

2.2.Elimination reactions. Hoffmann and Saytzeff's rules-cis and trans eliminations-mechanisms of E1 and E2 reactions - Elimination Vs Substitution. Reactivities of   methyl, ethyl, propyl, isopropyl, n-butyl, allyl, vinyl and benzyl halides.

UNIT-III

3.1.Phenols. Acidic character of phenols - explanation on the basis of resonance   stabilization. Ring substitution in phenol - orientation of phenolic group towards   electrophiles.

3.2.Mechanisms of esterification, nitration, sulphonation, halogenation, coupling with   diazonium salts, Kolbe's reaction, Reimer - Teimer reaction, Gattermann, Ledere   Manasse and Houben - Hoesch reactions.

UNIT - IV

4.1.Cresols, nitrophenols, aminophenols, di and trihydric phenols - alpha and beta naphthols - preparation and properties.
4.2.Thermodynamic derivation of the law of chemical equilibrium - reaction isotherm -   standard free energy change - standard free energy change and equilibrium constant -   variation of equilibriun constant with temperature - vant Hoff's isochore.

UNIT - V

5.1.Partial molar properties, Chemical potential - Gibb's - Duhem equation - effect of Temperature and pressure on chemical potential - chemical potential in systems of ideal   gases - Duhem - Margules equation.

5.2.Concept of fugacity and activity. Determination of fugacity of a gas - activity and   activity coefficient.

5.3.III law of thermodynamics. Nernst heat theorem - statement of III law of   thermodynamics. Evaluation of absolute entropy from heat capacity measurements - exceptions to III law.

<u>**Reference Books:**</u>

   1. Principles of Inorganic Chemistry - P.L. Soni

   2. Principles of Inorganic Chemistry - Puri & Sharma

   3. Principles of Inorganic Chemistry - R.D. Madan & Tuli

   4. Selected Topics in Inorganic Chemistry - Madam, Tuli, & Malik

   5. Principles of Organic Chemistry - P.L. Soni

6. Principles of Organic Chemistry - Bahl & Arun Bahl

7. Advanced Organic Chemistry - Tewari

8. Advanced Organic Chemistry - Morrison & Boyd

9. Principles of Physical Chemistry - P.L.Soni.

11...Priciples of Physical Chemistry - Puri & Sharma

11. Essentials of Physical Chemistry - Babl & Arun Bahl

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2

MODEL QUESTION PAPER- GENERAL CHEMISTRY- IV (17U4CH4)

Duration : 3 Hours   **Maximum : 75 Marks**

SECTION - A (10 X 2 = 20)

Answer all the Questions:

1. What is meant by common ion effect?

2. Explain the electron deficiency behavior of Boron?

3. Explain why Borazole is called as inorganic benzene?

4. Explain the mechanism of sulphonation reaction?

5. How naphthalene is prepared by Haworth's synthesis?

6. Explain the effect of substrate in SN_2 reaction?

7. Explain the condition for spontaneity in terms of entropy?

8. Explain why the efficiency of heat engine is always less than unity?

9. Show that the decrease in Gibb's free energy in an isothermal and isochoric process is equal to the net work available in that process.

10. Calculate the change in entropy when 28g of nitrogen is expanded from a volume of 2 lit to 10 lit at 298K. Assume nitrogen as an ideal gas.

SECTION - B (5 x 5 = 25)

Answer all the Questions:

All the Questions carry Equal Marks:

11a. Discuss the position of boron in periodic table

(or)

11b. Explain the preparation, properties, uses and structure of $LiAlH_4$ and borazonle?

12a. How is NaBH4 prepared? Give its mechanism of action.

(or)

12b. Explain the electrophilic substitution reaction of naphythalane.

13a. What is meant by Aromaticity? Explain Huckel's rule with examples.

(or)

13b. Describe the orientation of any five functional group on Phenol.

14a. Explain SN1 reaction with mechanism.

(or)

14b. Describe Friedel - Craft's Alkylation with mechanism.

15a. Derive Gibb's - Helmholtz equation. Give their significance.

(or)

15b. Define the concept of entropy using Carnot's cycle.

SECTION - C (3 X 10 = 30)

Answer any THREE questions:

16. i) How is Diborance prepared? (2)

    ii)Give the reactions in which it acts as an electron deficient compound. (3)

    iii) Explain the structure of diborane. (5)

17. i) Give the any spot test reagents and its uses. (5)

    ii) Explain the directive influence of the functional groups in the following.

      Nitrobenzene and Chlorobenzene. (5)

18. i) Illustrate the four factors which influence their effects on SN_1 reaction. (6).

    ii) Write down the nitration reaction with mechanism. (4).

19. i) Explain the carnot's cycle and derive an expression for the efficiency of a heat engine. (7)

    ii) Explain the need for the second law of thermodynamics. (3)

20. i) Derive an expression for the entropy change when the temperature and pressure

    of an ideal gas changes. (6)

    ii) Calculate the entropy of mixing of 88 grams of carbon dioxide and 2 moles of nitrogen under isothermal and isobaric conditions assuring ideal behaviors. (4).

Course	**: B.Sc. Chemistry**	**Semester**	**: 4th semester**
Subject	**: Chemistry Practical-II**	**Batch**	**: 2017 – 2018 Onwards**
Subject code	**: 17U4CHPR2**	**Credit**	**: 3**

Practical-II-Semi micro Qualitative Analysis & Inorganic Preparation

I. Students are expected to analyse the given inorganic salt mixture contains two anions out of which one is interfering anion and two cations.

Common anions: Chloride, Sulphate, Nitrate, Carbonate

Interfering anion: Fluoride, Oxalate, Phosphate, Borate.

Cations: Lead, Copper, Antimony, Bismuth, Cadmium, Iron, Manganese, Nickel, Cobalt, Zinc, Calcium, Strontium, Barium, Magnesium and Ammonium.

II. Preparations:

1. Ferrous Ammonium Sulphate.
2. Sodium thiosulphate.
3. Micro cosmic salt.
4. Copper tetra ammine sulphate**.**

SCHEME OF VALUATION

INORGANIC QUALITATIVE ANALYSIS AND PREPARATION

Internal assessment: 25 Marks

External assessment: 75 Marks

Total: 100 marks

Record: 15 Marks

Preparation: 20 (Quantity- 15 Marks; Quality- 5 marks)

Analysis: 40 Marks.

Each radical with procedure: 10 Marks

(Spotting for each radical - 5 Marks; Fixing the group - 5 Marks)

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
UNDERGRADUATE SYLLABUS UNDER CBCS

Course	**: B.Sc. Chemistry**	**Semester**	**: 4th semester**
Subject	**: Applied Chemistry**	**Batch**	**: 2017 – 2018 Onwards**
Subject code	**: 17U4CHSB**	**Credit**	**: 3**

OBJECTIVE:-

. To Study the Preparation and applications of polymers, leather chemistry and

Agricultural chemistry.

UNIT-I POLYMER CHEMISTRY

1.1.Classification of polymers – natural and synthetic rubber, cellulose, starch, wool, silk:

synthetic rubber, polyalkenes, acrylics, polyamides, polyesters, PVC polyurethane –starting

materials and uses only,

1.2. Molecular weight calculation- Number average and weight average methods..

UNIT-II DAIRY CHEMISTRY-I

2.1.Milk, Definition general composition- physico-chemical changes taking place in milk due to

boiling, pasteurization, sterilization and homogenization-explanation.

2.2.Components of milk lipids, proteins, carbohydrates, vitamins, ash and minerals matters-names

and functions.

UNIT-III DAIRY CHEMISTRY-II

3.1.Definiton and composition of-cream, butter, ghee, icecream-stabilizer and emulsifier.

3.2.Milk powder: Definition and need for making-manufacture of whole milk powder by spray

drying process.

UNIT-IV LEATHER CHEMISTRY

4.1. Structure and composition of hides, skins and leather. Principle of pretanning process. Vegetable, mineral and synthetic tanning. Chemistry ofchrometanning. Dyeingof leather.

4.2. Tannery effluents-pollution and control.

UNIT-V AGRICULTURAL CHEMISTRY

5.1. Soil: Definition, classification and properties of soil-soil water, soil oil, soil temperature soil minerals, soil colloids, soil pH, soil acidity, soil alkalinity.

5.2. Soil fertility and its evaluation-buffering of soil and its effect. Soil formation and its reclamation.

5.3. Classification examples for fungicides and herbicides fluorine compounds boron compounds, arsenic compounds, mercury compounds, pyridine compounds.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2

MODEL QUESTION PAPER- APPLIED CHEMISTRY (17U4CHSB)

Duration : 3 Hours   **Maximum : 75 Marks**

SECTION-A (10x2=20)

Answer all the questions. All Questions carry equal marks.

1. Define polymers?

2. Write the preparation and uses of poly vinyl chloride?

3. What is the chemical composition of milk?

4. What are the chemical composition of cream and butter?

5. Define sterilization?

6. What is meant by pasteurization?

7. Write any four fertilizers?

8. Explain soil pH?

9. What are composition of hides and skins?

10. What is tannery pollution?

SECTION-B (5x5=25)

II Answer any five questions. Each question carry five marks

11. a) What are the factors that affects the vegetable tanning?

(or)

b) What are the factors that affects the chrome tanning?

12. a) Explain the classification of soil?

(or)

b) Write a note on soil formation and its reclamation?

13. a) Write in detail about classification of polymers?

(or)

b) Discuss about special properties of LDPE and HDPE.

14. (a) Write short note about pasteurization and homogenization?

(or)

(b) Explain about physic chemical changes taking place in milk?

15. (a) Describe about components of milk lipids?

(or)

(b) Describe about components of milk proteins?

SECTION-C (3x10=30)

III Answer any three questions

16. Explain the molecular weight determination by number average method.

17. Describe about the application of polymers?

18. Discuss the methods of treatment of tannery effluents?

19. Write note on

i)soil fertility

ii)Herbicides

20.Explain the manufacture of milk powder by spray drying process.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
UNDERGRADUATE SYLLABUS UNDER CBCS

Course	**: B.Sc. Chemistry**	**Semester**	**: 5th semester**
Subject	**: Organic Chemistry-I**	**Batch**	**: 2017 – 2018 Onwards**
Subject code	**: 17U5CH5**	**Credit**	**: 6**

OBJECTIVE:

- To make the students more inquisitive in learning the mechanism of named reactions.
- To learn the synthetic applications of certain organic compounds.
- To effectively impart knowledge about carbohydrate chemistry, stereochemistry and heterocyclic chemistry.

UNIT-I: CARBOHYDRATES:

Reactions of glucose and fructose-osazone formation, muta rotation and its mechanism-structural elucidation of glucose and fructose-pyranose and furanose forms-determination of ring size-Haworth projection formulae-configuration of glucose and fructose- epimerization-chain lengthening and chain shortening of aldoses-inter conversion of aldoses and ketoses.

Disaccharides and polysaccharides: Reactions and structural elucidation of sucrose. Structure and properties of starch and cellulose.

UNIT-II: STEREO ISOMERISM:

Definition-classification into optical and geometrical isomerism Racemisation-methods of racemisation. Resolution-methods of resolution (mechanical, seeding, biochemical and conversion into diastereo isomers)-Asymmetric synthesis (partial and absolute synthesis)-Walden inversion.

PROJECTION FORMULAE:

Fischer, Flying wedge, Sawhorse and Newmann projection formulae-Cahn-Ingold-Prelog rules-RS, notation of optical isomers with one and two asymmetric carbon atoms-DL configurations.

UNIT-III

Optical activities in compounds not containing asymmetric carbon atoms: biphenyls, allenes and spiranes.

Geometrical isomerism: Cis-Trans, syn-anti and E-Z notations-geometrical isomerism in maleic and fumaric acids and unsymmetrical ketoximes-methods of distinguishing geometrical isomers using melting points, dipole moment, solubility, dehydration, cyclisation, heat of hydrogenation and combustion.

UNIT-IV

Aromaticity of heterocyclic compounds-Huckel's rule, Preparation, properties and uses of furan, pyrrole, thiophene, pyridine. Diazomethane, Diazo acetic ester-Preparations, structure and synthetic uses.

UNIT-V

Tautomerism: Definitions-Keto-enol tautomerism-identification, evidences, amido-imidol and nitro-acinitro tautomerisms.

Carbonyl polarization-reactivity of carbonyl group-acidity of alpha hydrogen, Malonic, acetoacetic and cyanoacetic esters-Characteristic reactions of active methylene group-synthetic uses of malonic, acetoacetic and cyanoacetic esters.

Reference books

1. Avanced organic reaction mechanism by N.Tewari

2. Organic Reactions mechanisms Raj K.Bansal-Tata MC Graw Hill Publisher.

3. Advanced organic Chemistry by Jerry March-Wiley.

4. Organic Spectroscopy-V.K.Ahluwalia-ANE Books 2015

5. Simplified course in organic chemistry-R.L.Madan by S.Chand Publisher-2015

6. Stereochemistry of organic compounds principles and Applications D-Nasi Puri-New Age Publisher - 2015

7. Organic Chemistry (7E) Morrison, Boyd, Battacharya Pearson - 2015

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2

MODEL QUESTION PAPER- ORGANIC CHEMISTRY-I (17U5CH5)

Duration : 3 Hours   **Maximum : 75 Marks**

SECTION-A (10x2=20)

Answer all questions. all questions carry equal marks

1. Give the pyranose and furanose forms of Glucose.

2. What happens when glucose is oxidized?

3. What do you mean by inversion of cane sugar?

4. What are the two structural components of Starch?

5. Define isoelectric point.

6. What is racemic mixture?

7. Define Huckel's rule

8. What is nitro-acinitro tautomerism?

9. What is relative configuration?

10. Draw the structure of meso tartaric acid?

SECTION-B (5x5=25)

Answer ANY FIVE questions. all questions carry equal marks

11. What is mutarotation? Explain with mechanism.

12. Glucose and Fructose give the same osazone with phenyl hydrazine. Explain why?

13. How will you convert an aldose into a ketose?

14. Write a note on resolution?

15. Compare the basicities of furan, pyrrole, thiophene and pyridine.

16. Write a note on keto-enol tautomerism.

17. Write a note on Walden inversion.

18. Write a note on asymmetric synthesis.

SECTION-C (3x10=30)

ANSWER ALL QUESTIONS

19. a) Elucidate the ring structure of Glucose.

Or

   b). i. How will you convert arabinose into Glucose

     ii. What is epimerization? Explain

20. a). i. Give any two chemical properties of cellulose

     ii. Explain the structure of starch.

Or

  b). Explain the optical activity of allenes and biphenyls

21. a). Explain the synthetic uses of malonic ester

Or

  b). Explain the synthetic uses of cyanoacetic ester.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
UNDERGRADUATE SYLLABUS UNDER CBCS

Course	**: B.Sc. Chemistry**	**Semester**	**: 5th semester**
Subject	**: Inorganic Chemistry-I**	**Batch**	**: 2017 – 2018 Onwards**
Subject code	**: 17U5CH6**	**Credit**	**: 6**

OBJECTIVE:

➢ **To impart knowledge about radioactivity and nuclear chemistry.**
➢ **To learn about d and f block elements.**
➢ **To give students a firm grounding in Co-ordination chemistry.**

UNIT-I: NUCLEAR CHEMISTRY-I

1.1 Natural radioactivity-Detection and measurement of radioactivity- GM counter, Scintillation counter-Radioactive series-Group displacement law, half-life period-Average life period.

1.2 Fundamental particale of the nucleus-Nuclides, isotopes, isobars, isotones, mirror nuclei. Nuclear radius, nuclear mass and nuclei. Forces operating between the nucleons-n/p ratio, curves, stability belts.

UNIT-II: NUCLEAR CHEMISTRY II

2.1 Nuclear binding energy- Mass defect-Binding energy per nucleon-Magic numbers-Liquid drop model-shell model.

2.2 Artificial radioactivity-induced radioactivity-uses of radioisotopes-hazards of radiations-nuclear fission-nuclear energy-nuclear reactors-nuclear fusion-thermo nuclear reactions-energy source of sun and stars.

UNIT-III: CHEMISTRY OF d-BLOCK ELEMENTS

Characteristics of d block elements-Occurrence, oxidation states, magnetic properties, colour and uses. Alloys and uses for Cu, Ni, Zn. Catalytic activity of Cu, Pt, Pd.

UNIT-IV

3.1 Chemistry of f block elements-Comparative account of lanthanides and actinides, occurrence, elements, oxidation states, magnetic properties, colour and spectra-lanthanide contraction-causes, consequences and uses, actinide contraction.

3.2 Metallurgy and metallurgical processes-zone refining, van-arkel process, electrolytic refining. Extraction, alloys and uses of Ti, Zr, Th and U. Steel alloys-heat treatment of steel. Preparation and uses of Ammonium Molybdate. V_2O_5, UF_6

UNIT-V: CO-ORDINATION COMPOUNDS

5.1 Nomenclature, Werner's theory, EAN rule, co-ordination number and geometry, chelation and effect of chelation. Applications of EDTA.

5.2 Isomerism in complexes-ionisation isomerism hydrate isomerism, linkage isomerism, ligand isomerism. Co-ordination isomerism, polymerization isomerism, geometrical and optical isomerism in 4 and 6 co-ordination complexes.

Reference books:

1. Inorganic chemistry- P.L. Soni-sultan chand (2006).
2. Inorganic chemistry- B.R. Puri, L.R. Sharma and K.C. Kallia- vallabh Publications (2003).

3. Selected topics in Inorganic chemistryW.U. Malik, G.D. Tuli and R.D. Madan, S. Chand publication (2003).

4. Inorganic chemistry- J.E. Huheey, Hauper and Collins. NY IV edition (1993)

5. Concise Inorganic chemistry- J.D. Lee- III edition- von Nostrand.

6. Inorganic chemistry- B.K. Sharma- Goel publications (1983).

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2

MODEL QUESTION PAPER- INORGANIC CHEMISTRY-I (17U5CH6)

Duration : 3 Hours   **Maximum : 75 Marks**

SECTION-A (10x2=20 Marks)

Answer all questions. All questions carry equal marks.

1. Write the Group displacement law?

2. What is meant by isotopes and isobars?

3. How will you prepare UF_6 and write its use?

4. Explain van Arkel process.

5. Write any two ores of Titanium.

6. Write any four uses of Zirconium.

7. Explain EAN rule.

8. Explain primary valency.

9. Write names of following complex.

      1. $(Pt(NH_3)_4(en)_2Cl_2)SO_4$

      2. $K_3(Fe(CN)_5NO_2)$

10. What is meant by Annealing?

SECTION-B (5x5=25 Marks)

Answer all questions.

11. a) What are alpha and beta – rays? Write their properties.

Or

b) Write about n/p ratio with examples.

12. a) Define and discuss packing fraction.

Or

b) Write the thermonuclear reaction

13. a) How do you extract thorium from its ore

Or

b) Write the causes and consequence of lanthanide contraction

14. a) How do you extract titanium from its ore.

Or

b) Write about any three steel alloys and their uses.

15.a) Write the preparation, properties & uses of ammonium molybdate.

Or

b) Write the preparation, properties & uses vanadium pentoxide.

SECTION-C (3x10=30 Marks)

Answer any three questions

16. a) Explain mass defect?

   b) Explain n/p ratio

17. Write about colour oxidation state and magnetic properties of lanthanaides

18. Explain optical isomerism in octahedral complexes

19. Compare the properties of chromium group elements

20. Explain linkage isomerism, ligand isomerism, Coordinate isomerism.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
UNDERGRADUATE SYLLABUS UNDER CBCS

Course : B.Sc. Chemistry   **Semester** : 5th semester
Subject : Physical Chemistry-I   **Batch** : 2017 – 2018 Onwards
Subject code : 17U5CHE1   **Credit** : 6

OBJECTIVES:

❖ To Promote the study of solutions with the application to day to

❖ To study distribution law.

❖ To study phase rule.

❖ To promote Interest in surface chemistry, catalysis, chemical kinetics.

UNIT-I: SOLUTIONS

   Solutions of gases in liquids - Henry's law - solution of liquids in liquids - Raoult's law - vapour pressure of ideal solutions - activity of a component in an ideal solution. Azeotropicmixtures - Distillation of Immiscible liquids solubility of partially miscible liquids - phenol water system.

Solubility of partially miscible liquids – phenol - water system. CST and effect of impuritites on CST. LCST systems – Nicotine – water, Triethyleneamine – water.

UNIT-II: PHASE EQULLIBRIA

Gibb's phase rule-statement and definition of terms - Application to one component systems - Water and sulphur systems - thermal analysis and cooling curves - Reduced phase rule - Two component system – Lead - silver system - Freezing mixture-Two component systems - Compound formation with congruent melting point – Zn - Mg system. Incongruent melting point $Na_2SO_4 – H_2O$

UNIT-III: SURFACE CHEMISTRY

Adsorption-physisorption and chemisorptions - Applications of adsorption - Adsorption of gases by solids-Freundlich adsorption isotherm-Langmuir's theory of adsorption-BET theory of multilayer adsorption (No Derivation)

CATALYSIS

General characteristics of catalytic reactions Acid-base catalysis-Enzyme catalysis Mechanism and kinetics of unimolecular enzyme catalyzed reactions-Michaelis-Menton equation-Effect of temperature pH on enzymecatalysis-Heterogeneous catalysis. Surface reactions-Kinetics of surface reactions.

UNIT-IV: CHEMICAL KINETICS-I

The rate equation-order and molecularity of a reaction-first, second, third and zero order reaction-half life time of a reaction-method of determining order of a reaction- effect of temperature on reaction rates-concept of activation energy-energy barrier-effect of catalyst.

UNIT V: CHEMICAL KINETICS-II

Collision theory and derivation of rate constant for bimolecular reactions-theory of absolute reaction rates-thermodynamic derivation for the rate constant for a bimolecular reaction from it-comparisonof collision theory and ARRT-significance of entropy and free energy of activation. Complex reactions-Consecutive, parallel and Reversible reactions (No Derivation-only Example)

Reference Books

1. Principles of Physical Chemistry-B.R.Puri and Sharma, 2012, 45th edition Vishal Publications
2. Essentials of Physical Chemistry-Arun Bahl, B.S. Bahl, G.D.Tuli, 2010, S. Chand & Co.
3. Physical chemistry-R.P. VArma, 1987, Pradeep publications.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2

MODEL QUESTION PAPER- PHYSICAL CHEMISTRY-I (17U5CHE1)

Duration : 3 Hours   **Maximum : 75 Marks**

SECTION-A (10x2=20)

Answer all questions

1. What is CST? How does it vary by the addition of NaCl to phenol water system?

2. What is fractional distillation?

3. What are freezing mixtures? Give example

4. Draw the phase diagrams of water systems

5. How does adsorption differ from absorption

6. Illustrate acid-base catalysis with an example

7. What is meant by zero order reaction? Give example.

8. Write the expressions for the rate constant and half life period of a second-order reaction.

9. Give two examples for reversible reaction.

10. What are parallel reactions? Illustrate with an example.

SECTION-B (5x5=25)

11. a. State and explain Henry's law.

or

b. State and explain Raoult's law.

12. a. Explain the phase diagram of Pb-Ag system.

Or

b. State Gibbs phase rule and explain the terms giving examples.

13. a. Discuss the mechanism of enzyme catalysis and derive Michaelis-Menton equation.

Or

b. Explain with suitable examples physical adsorption and chemisorptions.

14. a. Give the difference between order and molecularity of a reaction.

Or

b. What is half life period? If the half life period of a first order reaction is3 0 minutes, calculate the time required for the completion of 75% of the reaction.

15. a. Compare the collision theory with the theory of Absolute reaction rate.

Or

b. What are the postulates of the collision theory of reaction rates? What are its limitations?

SECTION-C (3x10=30)

Answer any three questions

16. Discuss the distillation of a binary liquid mixture which exhibit maximum and minimum boiling point in the temperature composition diagram.

17. Explain compound formation with congruent and incongruent melting points with suitable diagrams.

18. Discuss the Langmuir's adsorption isotherm and deduce the equation.

19. Describe two methods for the determination of order of a reaction.

20. Derive the expression for rate constant of a bimolecular reaction using ARRT.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
UNDERGRADUATE SYLLABUS UNDER CBCS

Course	**: B.Sc. Chemistry**	**Semester**	**: 5th semester**
Subject	**: Analytical Chemistry-I**	**Batch**	**: 2017 – 2018 Onwards**
Subject code	**: 17U5CHSB**	**Credit**	**: 3**

OBJECTIVES:

- To know minimizing errors
- To know thermo analytical methods.
- To know gravimetric analysis methods.
- To know chromatographic techniques.
- To know polarography.

UNIT-I

Data analysis-theory of errors-idea of significant figures and its importance with examples-precision-accuracy-methods of expressing accuracy-errors analysis-minimizing errors method of expressing precision-average deviation-standard deviation and confidence limit.

UNIT-II

Thermo analytical method-principle involved in thermo gravimetric analysis and differential thermal analysis-characteristics of TGA DTA and DSC-thermo grams-factors affecting TGA DTA and DSC curves-discussion of various components of the instrument with block diagrams-applications of thermogravimetry-applications of DTA-thermometric titration.

UNIT-III

Principles of gravimetric analysis-characteristics of precipitating agents-choice of precipitants-conditions of precipitation-specific and selective precipitants-DMG, cupferron, salicylaldehyde, ethylene diamine-use of sequestering agent-co-precipitation, Post precipitation-difference-reduction of errors-peptisation-precipitation from homogeneous solution-calculation in gravimetric methods-use of gravimetric factor.

UNIT-IV

Chromatographic techniques-principle of adsorption and partition chromatography column chromatography-principle-adsorbents used-preparation of column-adsorption-elution-recovery of substances-application.

Thin layer chromatography-principle-choice of adsorbent and solvent-preparation of chromatogram-Rf value-application of TLC in organic and inorganic chemistry.

Paper chromatography-solvent used-principle-Rf value-factors influencing Rf Value-application-separation of amino acid mixture-radial paper chromatography. Paper electrophoresis-principle and application.

UNIT-V

Polarography-principle-concentration polarization-dropping mercury electrode-advantage and disadvantages-convection, migration and diffusion current-ilkovic equation (derivation not required) and significance-experimental assembly electrodes-capillary solution-current voltage curve-oxygen wave-influence of temperature and agitation on diffusion layer-polarography as an analytical tool in quantitative analysis.

Reference Books

1 Analytical chemistry by Gopalan

2 Analytical chemistry by Voghel.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2

MODEL QUESTION PAPER- ANALYTICAL CHEMISTRY-I (17U5CHSB)

Duration : 3 Hours   **Maximum : 75 Marks**

SECTION-A (10x2=20)

ANSWER ALL QUESTIONS

1. What is the number of significant figures of 0.05080?

2. What is Range?

3. What property studied by DTA?

4. What type of current recorded in polarization studies?

5. Which precipitating agent is used to estimate magnesium?

6. What is Rf value?

7. What is minimum requirement for thermal studies?

8. What material is used as stationary phase paper chromatography?

9. Which anode is used in polarography?

10. Define specific rotation?

SECTION-B (5x5=25)

11. a. What are the advantage of standard deviation?

Or

b. What are difference between precision and accuracy?

12. a. Discuss significant figures and its importance

Or

b. Explain peptisation with suitable examples

13. a, What are sequestering agent? Give examples.

Or

b. Explain applications of DTA

14.a. How do you prepare a plate of TLC

Or

b. Explain column chromatography.

15. a. Explain the instrumentation of polarography.

Or

b. Describe the effect of temperature on the diffusion layer.

SECTION-C (10x3=30)

ANSWER ANY THREE QUESTIONS.

16. Write in detail on the application of polarography in qualitative analysis.

17. Draw the block diagram of the instrument for DTA?

18. Discuss the principle, procedure and application of PC

19. Bring out the advantages and disadvantages of organic precipitants.

20. What are the advantages of standard deviation?

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
UNDERGRADUATE SYLLABUS UNDER CBCS

Course	: B.Sc. Chemistry	**Semester**	: 6th semester
Subject	: Organic Chemistry-II	**Batch**	: 2017 – 2018 Onwards
Subject code	: 17U6CH7	**Credit**	: 5

OBJECTIVE:

* To understand the basic concepts of organic photochemistry.

* To create interest in students in learning bio-organic chemistry through the topic

   such as proteins, nucleic acids, terpenes, alkaloids etc.,

*To understand the mechanism of molecular rearrangements.

UNIT-I

1.1 Organic photochemistry: Types of photochemical reactions- photo dissociation- isomerizations. Cyclisation , dimerisation and oxetane formation. Norrish type I and II reactions. Photo- Fries rearrangement.

1.2   Terpenes: Isoprene rule-structural elucidation of menthol, alpha terpeniol.

UNIT-II

2.1   Amino acids classification (essential and general amino acids)-(neutral, acidic and basic amino acids)-structure of amino acids.

2.2   Amino acids: Preparations and properties of alpha amino acids-Gabriel phthaliimide synthesis strecker synthesis, Erlen meyer Synthesis-Zwitter ion, isoelectric point.

UNIT-III

3.1   Polypeptides and proteins: Classifications of proteins based on physical and chemical properties and physiological functions-primary and secondary structural of proteins-helical and sheet structures-Denaturation of proteins.

3.2 Nucleic acid: Nucleoside, Nucleotide, degradation of nucleotide, Chemical structure of nucleic acids-RNA and DNA-elementary idea about proteins synthesis.

UNIT-IV

4.1   Alkaloids: Isolation and structural elucidation of conine and nicotine.

4.2. Conformational analysis: Introduction of terms-conformers, configuration, dihedral angle, Conformational analysis of ethane , n-butane and cyclohexane including energy diagrams.

UNIT-V

5.1 Molecular rearrangements: Classification-anionotropic and cationotropic, intermolecular and intramolecular rearrangements.

5.2 Mechanisms, evidences, migratory aptitude, inter and intra molecular rearrangements: Pinacol-Pinacolone, Benzilic acid, Cope, Oxy cope, Beckmann, Bayer-Villager,Hoffmann, Lossen, Curtius Claisen (Sigmatropic) and Fries.

Reference books

1. Avanced organic reaction mechanism by N.Tewari

2. Organic Reactions mechanisms Raj K.Bansal-Tata MC Graw Hill Publisher.

3. Advanced organic Chemistry by Jerry March-Wiley.

4. Organic Spectroscopy-V.K.Ahluwalia-ANE Books 2015

5. Simplified course in organic chemistry-R.L.Madan by S.Chand Publisher-2015

6. Stereochemistry of organic compounds principles and Applications D-Nasi Puri-New Age

Publisher - 2015

7. Organic Chemistry (7E) Morrison, Boyd, Battacharya Pearson - 2015

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2

MODEL QUESTION PAPER- ORGANIC CHEMISTRY-II (17U6CH7)

Duration : 3 Hours   **Maximum : 75 Marks**

SECTION-A(10x2=20)

ANSWER ALL QUESTIONS

1. What is meant by photochemical reactions?

2. Write the structure of alpha-terpeniol and menthol

3. What are amino acids? Give examples.

4. What is meant by isoelectric point of amino acids?

5. What are proteins?

6. What is meant by end group analysis?

7. Define conformational analysis.

8. What are alkaloids? Give two examples.

9. What is meant by molecular rearrangements? How are they classified?

10. Write the pinacol-pinacolone rearrangement

SECTION-B (5x5=25)

11. a. Elucidate the structure of menthol

   or

   b. Discuss the types of photochemical reactions.

12. a. Explain the classification of amino acids.

   Or

   b. How amino acid is prepared by Gabriel phthalimide synthesis method and strecker synthesis method.

13. a. Distinguish between RNA and DNA

   Or

   b. Explain the classification of proteins by physical and chemical properties

14. a How will you arrive at the structure of Nicotine?

   or

   b. Discuss about conformations of n-Butane.

15. a. Explain Hoffmann rearrangement with suitable mechanism.

   Or

   b. Illustrate the mechanism of fries rearrangement.

SECTION-C (3x10=30)

16. a. Explain Norrish I and II reactions

   b. Elucidate the structure of terpeneol

17. a. Discuss the properties of alpha-amino acids.

   b. What is meant by "Zwitter Ion?

18. a. Explain briefly about structure of proteins.

   b. What are Nucleic acids? How are they classified?

19. a. Describe the conformational analysis of Ethane.

   b. Elucidate the structure of conine.

20. a. Illustrate the mechanism of

i) Benzilic acid rearrangement

ii) Cope rearrangement

ii) Bayer-villager rearrangement

Course	**: B.Sc. Chemistry**	**Semester**	**: 6th semester**
Subject	**: Inorganic Chemistry-II**	**Batch**	**: 2017 – 2018 Onwards**
Subject code	**: 17U6CH8**	**Credit**	**: 5**

OBJECTIVE:

➢ To understand the concept of crystal field theory.
➢ To understand the bonding and structure of metal carbonyls.
➢ To understand the engineering inorganic materials.

UNIT-I: COORDINATION CHEMISTRY

1.1 Theory of bonding: Valence bond theory- hybridization, geometry and magnetic properties. Failure of VBT.

1.2 Crystal field theory: Spectrochemical series- splitting of d orbitals in octahedral, tetrahedral and square planar complexes-crystal field stabilization energy-calculation of CFSE in octahedral and square planar complexes.

UNIT-II

2.1 Low spin and high spin complexes-explanation of magnetic properties, colour and geometry using CFT-Trans effect and Jahn Teller effect.

2.2 Comparison of VBT and CFT. Application of co-ordination compounds in qualitative and quantitative analysis-Detection of potassium ion, separation of Cu and Cd ions, Estimation of Ni using DMG and Al using oxine.

UNIT-III: ENGINEERING INORGANIC MATERIALS

3.1 Composition,Manufacture and Setting of Cement. Examples for pigments-constituents of paints and varnishes. Types of glasses, manufacture and processing of glass. Refractories and Abrasives-Definitions, properties and uses.

UNIT-IV

4.1. Bioinorganic chemistry: Biological aspects of Fe, Zn, Mg, Co and Mo. Role of Na, K , Ca and P.

4.2. Metal carbonyls: Definition, preparation, physical and chemical properties, nature of M-CO linear band based on M.O. Theory with spectral support, classification of metal carbonyls.

UNIT-V

5.1. Types of CO groups and detection of CO group using IR Spectra.

5.2. Structure and hybridisation of $Ni(CO)_4$, $Fe(CO)_5$, $Fe_2(CO)_9$, $Co_2(CO)_8$, $Fe_3(CO)_{12}$ and $Mn_2(CO)_{10}$. Metal nitrosyls.

Reference books:

1. Inorganic chemistry- P.L. Soni-sultan chand (2006).

2. Inorganic chemistry- B.R. Puri, L.R. Sharma and K.C. Kallia- vallabh Publications (2003).

3. Selected topics in Inorganic chemistryW.U. Malik, G.D. Tuli and R.D. Madan, S. Chand publication (2003).

4. Inorganic chemistry- J.E. Huheey, Hauper and Collins. NY IV edition (1993)

5. Concise Inorganic chemistry- J.D. Lee- III edition- von Nostrand.

6. Inorganic chemistry- B.K. Sharma- Goel publications (1983).

7. Engineering chemistry- Jain & Jain .

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2

MODEL QUESTION PAPER- INORGANIC CHEMISTRY-II (17U6CH8)

Duration : 3 Hours   **Maximum : 75 Marks**

SECTION-A(10x2=20 marks)

Answer all questions. All questions carry equal marks.

1. Name the metal ions present in vitamin B12 and chlorophyll.

2. Give any examples each for a colored and colorless complex.

3. What is the geometry and hybridization present in the complex?

4. Draw the structure of $Fe(CO)_5$

5. Give classification of metal carbonyls.

6. What are the causes for radioactive pollution?

7. Define Glass?

8. What is meant by Refractories.

9. Give the classification of paints.

10. Define trans effect?

SECTION-B (5x5=25 marks)

Answer all questions.

11. a. Explain the splitting of d orbitals in octahedral and tetrahedral geometry.

Or

  b. Write a short note Valence bond theory.

12. a. Explain the types of glasses.

Or

  b. Explain the classification of refractories.

13. a. Write short note on varnishes.

Or

  b. Explain the geometry, hybridization and magnetic property of $(Ni(CO)_4$

14a. Explain classification of metal carbonyls.

Or

  b.Explain the biological role of Na, K, Ca.

15. a.Compare Valence Bond theory and Crystal field Theory.

Or

  b.Write short note on metal nitrosyls.

SECTION-C(3x10=30 marks)

ANSWER ANY THREE QUESTIONS.

16. Discuss in detail the nature of bonding and structure involved in metal carbonyls $Co_2(CO)_8$

    and $Mn_2(CO)_{10}$.

17. Write a short note on pigments, abrasives.

18. Describe anyone method of manufacture of cement.

19. Explain estimation of Ni using DMG and Al using oxine.

20. Explain in detail for spectrochemical series.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
UNDERGRADUATE SYLLABUS UNDER CBCS

Course	: B.Sc. Chemistry	**Semester**	: 6th semester
Subject	: Physical Chemistry-II	**Batch**	: 2017 – 2018 Onwards
Subject code	: 17U6CHE2	**Credit**	: 4

Aim and objective:

To study photo chemistry, laser techniques and its introduction.

To promote interest in group theory

To study Electro Chemistry thoroughly

UNIT-I: PHOTOCHEMISTYRY

1.1 Laws of photochemistry- fluorescence's and phosphorescence's- primary and secondary reactions- kinetics of hydrogen- bromine reaction – photosensitization –chemiluminescence's – lasers- uses of lasers.

1.2 Group theory: symmetry operations- products of symmetry operations- classes and subgroup-group multiplication table- properties of a group- point group-C_{2v} ,C_{3v},C_{2h},D_{4h}, D_{2h},D_{3h},T_d, O_h(any one example)

UNIT-II: ELECTROCHEMISTRY-I (CONDUCTANCE)

Introduction : Conductors, Types of conductors, Conductance – Specific, equivalent and Molar Conductance. Effect of dilution on conductance - Transport number and its determination by Hittorf's and moving boundry method- effect of temperature and concentration-Ionic mobility and ionic conductance Kohlrausch's law and its applications. Applications of conductivity measurements-degree of hydrolysis, solubility product and conductometric titrationa**.**

UNIT-III: ELECTROCHEMISTRY-II (Theories of conductance)

Debye- Huckel limited law its verification Theory of strong electrolytes -Debye-Huckel- Onsagar theory- Verification of Onsagar equation- Wein Effect and Debye Falkhenhagen effect – ionic strength-activity and activity coefficient of strong electrolysis.

UNIT-IV: ELECTROCHEMISTRY-III (Construction of Electrodes and cells)

Galvanic cell- reversible and irreversible electrodes and cells- strandard cell- emf and its measurement-types of electrodes-electrode reaction-electrode potential-reference electrodes-standard electrode potential. Derivation of Nernst equation for electrode potential and cell emf –signconventions-electrochemicalseries-Calculation of

ΔG, ΔH, ΔS and equilibrium constant- determination of pH using quinhydrone and glass electrodes-potentiometric titrations.

UNIT-V: ELECTROCHEMISTRY –IV (Concentration Cells and polarization)

Chemical cells and concentration cells with and without transferences-examples and derivation of expression for their emfs-liquid junction potential. Application of concentration cells-determination of valence of ions, Transport number equilibrium constant, solubility product and activity coefficient of electrolytes. Concentration polarization and over voltage of applications. Storage cell-lead storage battery- mechanism of discharging and recharging. Hydrogen-oxygen fuel cell.

Reference Books

1. Principles of Physical Chemistry-B.R.Puri and Sharma-Shobanlal Nagin Chand & Co.,
2. Physical Chemistry-Negi and Anand-New Age.
3. Physical chemistry-Kundu and Jain-S.Chand.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2

MODEL QUESTION PAPER- PHYSICAL CHEMISTRY-II (17U6CHE2)

Duration : 3 Hours   **Maximum : 75 Marks**

SECTION-A (10x2=20)

ANSWER ALL QUESTIONS

1. What is chemiluminescene?
2. Write the symmetry point groups of a)water b)BF3

3. Define Transport number of an ion.

4. Define the term P_H

5. What are strong electrolytes? Give eample

6. write the Debye-Huckel –Onsagar equation?

7. What is meant by E.M.F of a cell

8. What is electrochemical series

9. What is meant by LJP

10. What are fuel cells? Give two examples

SECTION-B (5x5=25)

Answer all questions

11. a. Explain the term fluorescence and phosphorescence

or

   b. Explain the term symmetry operations.

12. a. State and explain kohlrauch's law. Mention any two applications of it.

Or

   b. Discuss two analytical application of solubility product.

13. a. Expalain Wein effect.

Or

   b. Discuss Debye-Falkenhagan effect.

14. a. Write a short not on glass electrode.

Or

   b. Write a note on Quin-hydrone electrode.

15. a. What are the different types of concentration cells

Or

   b. Write a short note on i) Salt bridge ii) over voltage

SECTION-C (3x10=30)

16. Write the mechanism of Hydrogen-Bromine photochemical reaction and derive the rate law.

17. Describe Hittorff's method for the determination of Transport number of an ion.

18. Explain Debye-Huckel-Onsagar theory and describe an experimental method to verify the theory.

19. Derive Nernt's equation

20. Describe the working function of lead storage battery.

Course : B.Sc. Chemistry   **Semester** : 6th semester

Subject : Spectroscopy   **Batch** : 2017 – 2018 Onwards

Subject code : 17U6CHE3   **Credit** : 4

OBJECTIVES:

- To study the spectroscopic techniques like UV-visible, IR, Raman, NMR, Mass.

UNIT-I

UV-Visible spectroscopy-absorption laws. Calculation involving Beer lamberts law-instrumentation photo calorimeter and spectrophotometer-block diagrams with description of components-theory-types of electronic transitions-chromophore and auxochromes-absorption bands and intensity-factors govering absorption maximum and intensity.

UNIT-II

Infra red spectroscopy: Molecular vibrations-Hooke's law-vibrational frequencies-factors affecting vibrational frequencies-instrumentation-block diagram-source-monochromator-cell sampling techniques-detector and recorders-solvent shift-identification of simple organic molecules like aldehydes, ketones, alcohols and aromatic hydrocarbons.

UNIT-III

Raman Spectroscopy: Rayleigh and Raman scattering-stokes and anti stokes lines-instrumentation-block diagram-differences between IR and RAMAN Spectroscopy-mutual exclusion principle-applications.

UNIT-IV

NMR spectroscopy principle of nuclear magnetic resonance-basic instrumentation-shielding mechanism-chemical shift-number of signals-spin-coupling and coupling constants-splitting of signals-NMR spectrum of simple organic compounds such as ethyl bromide, 1,1,2-tribromoethane, ethanol, acetaldehyde, ethylacetate, toluene and acetophenone.

UNIT-V

Mass spectroscopy: Basic principles of mass spectrum-molecular peak-base peak-isotopic peak-meta stable peak-factors influencing the fragmentation-Nitrogen rule-determination of molecular formula with examples-instrumentation-examples of fragmentation of n-alkanes, branched alkanes and alkenes. Mclafferty rearrangement.

Reference books

1. spectroscopy by Y.R.SHARMA
2. spectroscopy by P.S.KALSI
3. spectroscopy by BANWEL

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2

MODEL QUESTION PAPER-SPECTROSCOPY (17U6CHE3)

Duration : 3 Hours   Maximum : 75 Marks

SECTION-A (10x2=20)

Answer all questions

1. What are Quanta and Einstein?

2. State and explain Grotthus-Droper law

3. Write the Principle of IR Spectrum

4. Write the Selection rules for Vibrational Spectra

5. Explain mutual Exclusion principle with suitable example

6. Mention the Principle of NMR

7. Discuss shielding?

8. Explain Lande's Splitting factor

9. Discuss Metastable Ion

10. Explain molecular Ion peak

SECTION-B (5X5=25)

Answer all the questions.

11. a. Explain red shift and blue shift

or

   b. Discuss conjucation effect.

12. a. Expalin Beer-Lamberts law

Or

   b. Discuss Chromophore and auxochorme.

13. a. Discuss the IR Spectrum of CO2

Or

   b. Discuss the instrumentation of IR

14. a. Discuss the diamagnetic anisotropic shielding.

Or

   b. Write briefly coupling constant.

15. a. Write applications of NMR Spectra

Or

b. What are the difference between NMR and ESR

SECTION-C (3x10=30)

Answer any three questions

16**.** Explain difference fragmentation pattern with example.

17. What is the effect of hydrogen bonding on chemical shift.

18. What are the advantages in using TMS as reference.

19. Explain the Stereochemical factors which affect max.

20. Explain Mclafferty rearrangement with example.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
UNDERGRADUATE SYLLABUS UNDER CBCS

Course   : B.Sc. Chemistry   Semester   : 6ᵗʰ semester

PHYSICAL CHEMISTRY EXPERIMENTS

1. Determination of Transition temperature of the hydrated salt.

2. Determination of critical solution temperature. Phenol-water system

3. Determination of the concentration of the electrolyte using CST of Phenol-Water system

4. Determination of molecular weight-Rast's macro method.

5. Determination of rate constant of acid-catalysed hydrolysis of an ester

6. Kinetics of Iodination of acetone

7. Determination of Equivalent conductance of a strong electrolyte

8. Acid-base titration(HCL vs NaOH)

9. Kinetics of persulphate-iodide reaction.

SCHEME OF VALUATION

Internal assessment: 25 Marks

External assessment: 75 Marks

Total: 100 Marks

Record: 15 Marks

Experiment: 45 Marks

Manipulation, Tabulation and Calculation: 15 Marks

1) **Kinetics**

     Graph   : 10 Marks

     Below a factor of 10   : 35

     By a factor of 10   : 25

     More than a factor of 10   : 15

2) **Molecular weight**

     Error upto 10 % : 45

                 20 % : 35

30 % : 25

> 30 % : 15

3) Effect of electrolyte on CST

Graph: 10

Error upto 10 % : 35

20 % : 25

30 % : 15

> 30: 10

4) Transition temperature

Graph: 10

Error upto 2°C difference: 35

7°C difference: 25

> 7°C difference: 15

5) Conductance

Equivalent conductance: 25 marks		Cell constant : 20 marks	
Error upto 10 %	: 25	Error upto 10 %	: 20
Upto 15 %	: 15	Upto 15 %	: 15
>15 %	: 10	>15 % : 10	

6) Conductometric titration

Graph: 10

Upto 2 % : 35

2.1 to 3 % : 30

3.1 to 4 % : 25

4.1 to 5 % : 20

> 5% : 15

GRAVIMETRIC ESTIMATION

1. Estimation of Barium as Barium Sulphate.

2. Estimation of Barium as Barium Chromate.

3. Estimation of Sulphate as Barium Sulphate.

4. Estimation of Lead as Lead chromate.

5. Estimation of Calcium as Calcium oxalate monohydrate.

SCHEME OF VALUATION

Internal assessment: 25 Marks

External assessment: 75 Marks

Total: 100 marks

Record: 15 Marks

Procedure: 10 Marks

Error upto   2 %   : 50

               2.1 – 3 %   : 40

               3.1 – 4 %   : 30

               4.1 – 5 %   : 20

                  >5 %   : 10

a.   Among the duplicate results, the value more favorable to the candidate must be taken.

b.   When no duplicate result is given deduct 5 marks.

c.   If the two results differ by more than 2 % deduct 5 marks.

d.   For each independent arithmetical error deduct 1 mark.

e.   For incomplete or wrong calculation deduct 20 %.

f.   For no calculation deduct 40 %.

g.   If the experiment is not completed due to an accident, award 5 marks.

Course	: B.Sc. Chemistry	Semester	: 6th semester
Subject	: Organic Qualitative Analysis-V	Batch	: 2017 – 2018 Onwards
Subject code	: 17U6CHPR5	Credit	: 5

ORGANIC CHEMISTRY PRACTICAL

I.QUALITATIVE ANALYSIS AND ORGANIC PREPARATION

1. Analysis of organic compounds containing one functional group and characterization with a derivative

2. Reactios of the following functional groups:

Aldehyde, Ketone, Carboxylic acid (Mono and di), Ester, Carbohydrates, (Reducing and non reducing), Phenol, Aromatic primary amine, amide, nitro compound, diamide and anilide.

II ORGANIC PREPARATIONS (ANY THREE)

ACYLATION

   (a) Acetylation of salicylic acid or aniline.

   (b) Benzylation of aniline or phenol.

HALOGENATION

   (c) Preparation of p-bromo acetanilide.

   (d) Preparation of 2,4,6-tribromophenol.

HYDROLYSIS

   (e) Hydrolysis of ethyl benzoate (or) methyl salicylate

REFERENCE BOOKS FOR PRACTICALS

   1. Vogel's text book of chemical analysis

   2. Practical chemistry – A.O. Thomas-Scientific book centre, Cannanore.

   3. Practical Chemistry - S.Sundharam-3 Volumes-S.Viswanthan

   4. Vogel's text book of practical organic chemistry – Longman.

SCHEME OF VALUATION

Internal assessment: 25 Marks	External assessment: 75 marks
Total: 100 marks	Record: 15 Marks
Preparation: 15 (quantity: 10 & quality: 5)	Analysis: 45
Preliminary reaction: 4	Aliphatic/ Aromatic: 4
Saturated/ Unsaturated: 4	Tests for elements: 9
Functional groups: 10	Confirmatory tests: 10
Derivative/Coloured reaction: 4	

Course	: B.Sc. Chemistry	Semester	: 6th semester
Subject	: Industrial Chemistry	Batch	: 2017 – 2018 Onwards
Subject code	: 17U6CHSB	Credit	: 3

OBJECTIVES:

- To know the basic ideas of generation of energy from various types of fuels.

- To know the basic principles and applicationsof Industries

- To make the students aware of the impact of chemistry on environment and imbibe the concept of sustainable developments.

- To educate the students with respect to skills and knowledge to practice chemistry in ways that in beign to health and environment.

UNIT-I: ADHESIVES AND PAPER

Introduction-classification of adhesives, adhesives action, development of adhesive strength, chemical factors influencing adhesive action, bonding processes by adhesives, advantages and limitations, examples. Pulp and Paper-Introduction, Manufacture of pulp and paper. Processing of pulp-beating, refining, filling, sizing and coloring.

UNIT-II: OILS AND FATS

Classification of oils, fat splitting, distillation of completely miscible and immiscible oils, hydrogenation of oils, rancidity, saponification value, Iodine number, acid value. Soap and synthetic detergent, preparation of soap and detergent, different types of soap and their composition. Surfactant (LAS, ABS, LABSA), detergents binders and builders.

UNIT-III: GLASS AND CREAMICS

Glass: Glassy state and its properties, classification (silicate and non-silicate glasses). Manufacture and processing of glass. Composition and properties of the following types of glasses: Soda-lime glass, armoured glass, safety glass, borosilicate glass, fluorosilicate, coloured glass, photosensitive glass. Ceramics: Important clays and feldspar, ceramic, their types.

UNIT-IV: LUBRICANTS

Classification of lubricants, lubricationg oils (conducting and non-conducting) Solid and semisolid lubricants, synthetic lubricants. Properties of lubricants (Viscosity index, cloud point, pour point,) and their determination.

UNIT-V: FOOD ADULTERANTS AND ADDITIVES

Common adulterants in different foods-milk and milk products, vegetable oils, and fats, spices and condiments, cereals, pulses, sweeterning agents and beverages. Contamination with toxic chemicals-pesticides and insecticides. Principles involved in the analysis, detection and prevention of food adulteration. A general study of food flavours, colours and preservatives, artificial sweeteners. Food deterioration, methods of preservation and processing.

Suggested Readings

1. O.P.Vermani, A.k.Narula: Industrial Chemistry, Galgotia Publications Pvt Ltd New Delhi.
2. S.C.Bhatia: Chemical Process Industries Vol I&II CBS Publishers New Delhi
3. P.C.Jain M.Jain Engineering Chemistry Dhanapat Rai & Sons Delhi

Course	: B.Sc. Phy/Math/Zoo/Nut	**Semester**	: 1st & 3rd semester
Subject	: Allied Chemistry-I	**Batch**	: 2017 – 2018 Onwards
Subject code	: 17U1ACH1 / 17U3ACH1	**Credit**	:

OBECTIVES:

To Know about the knowledge metallurgy, stereo isomerism, vsepr theroy, thermodynamics, osmosis

UNIT-I

1.1Extraction of Metals: Minerals and Ore difference - Minerals of Iron, Aluminum and Copper - Ore Dressing or concentration of Ore - Types of Ore Dressing:Froth Floatation, Gravity and Magnetic separation.

1.2 Refining of Metals - Types of Refining - Electrolytic, Van Arkel and Zone Refining. Extraction of Uranium and Thorium.

UNIT - II

2.1 Polarization effects:- Inductive effect, mesomeric effect and steric effect 2.2 Stereo isomerism - Types, Causes of optical activity of lactic acid and tartaric acid - Racemization - Resolution - Geometrical isomerism - maleic and fumaric acid.

UNIT – III

3.1 First law of I thermodynamics - Need for the ll law of thermodynamics and statements. Carnot's cycle and efficiency of a heat engine.(simple problems only)

3.2 Principle and application of column, paper and thin layer chromatography.

UNIT – IV

4.1 VSEPR Theory - Shapes of Simple Molecules BF_3, PCl_5, SF_6 and XeF_6

4.2 Fuels - Calorific value of fuels - Non-conventional fuels - need of Solar energy - Applications - Bio-fuels.

UNIT - V

5.1 Crude Oil - Petroleum - Petroleum Refining - Cracking - Applications of Cracking. Naphthalene - Preparations,Structure,Properties and uses of Naphthalene

5.2 Osmosis - Osmotic pressure - reverse osmosis - desalination of sea water.

Duration : 3 Hours   **Maximum : 75 Marks**

SECTION-A (10x2=20)

I Answer all questions

1. Define froth floatation?

2. Define types of refining?

3. Define polarization?

4. What is stereo isomerism?

5. What is racemization?

6. What is mean by osmosis?

7. What is steric effect?

8. Define II law of thermo dynamics?

9. Define minerals and Ore?

10. Explain VSEPR theory?

SECTION-B (5x5=25)

II Answer any five Questions.

11. (a) Write about concentration of ore?

(or)

   (b) What is the difference between inductive effect and mesomeric effect?

12. (a) Discuss about Geometrical isomerism?

(or)

   (b) Explain the application of TLC?

13. (a) Explain the application of solar energy?

(or)

   (c) Draw the structure of BF_3, PCl_5?

14. (a) Write short note about calorific value of fuels?

(or)

   (b) Explain about bio fuels?

15. (a) Describe desalination of sea water?

(or)

   (b) Describe carnot's cycle?

SECTION-C (3x10=30)

III Answer any three questions

16. Write down the properties and uses of naphthalene?

17. Write a short note on osmotic pressure.

18. Write short note on Non-conventional fuels.

19. Write principle and application of column chromatography.

20. Explain the extraction of uranium?

Course : B.Sc. Phy/Math/Zoo/Nut   **Semester** : 2nd & 4th semester

Course : B.Sc. Phy/Math/Zoo/Nut **Semester** : 2nd & 4th semester
Subject : Allied Chemistry-II **Batch** : 2017 – 2018 Onwards
Subject code : 17U2ACH2 / 17U4ACH2 **Credit** :

OBECTIVES:

To know the knowledge about the Co-Ordination Chemistry, Carbohydrates, Aminoacids, Proteins, Photochemistry, Electrochemistry, Paints, vitamins, sulpha drugs, etc.

UNIT I

1.1 Co-ordination Chemistry: Nomenclature of co-ordination compounds - Werner Theory of Co-ordination Compound - Chelation - Functions and structure of Hemoglobin and Chlorophyll.

1.2 Industrial Chemistry: Fertilizers and manures - Bio-fertilizers- Organic Manures and their importance - Role of NPK in plants - preparation and uses of Urea, Ammonium nitrate, potassium nitrate and super phosphate of lime.

UNIT-II

2.1 Carbohydrates: Classification - structure of glucose - Properties and uses of starch - uses of Cellulose Nitrate - Cellulose acetate.

2.2 Amino Acid and Protein: Classification of Amino Acids - preparation and properties of Glycine - Classification of Protein based on Physical properties and biological functions and structure

UNIT III

3.1 Photochemistry - Grothus Drapers law, stark einsteines law - quantum yield - photosynthesis, phosphorescence - fluorescence - chemiluminescence's - photosensitization.

3.2 Electrochemistry: Ionic equilibria-Strong and weak electrolytes. Acid-Base, Common ion Effect,

pH, Buffer solution and buffer action in biological systems.

UNIT-IV

4.1 Paints - Pigments - Components of Paint - Requisites of a good paint. Colour and Dyes - Classification based on constitution and application.

4.2 Vitamins: Biological activities and deficiency diseases of Vitamin A, B, C, D, E and K - Hormones - Functions of insulin and adrenaline.

UNIT-V

5.1 Drugs- Sulpha Drugs - Uses and Mode of action of Sulpha Drugs -- Antibiotics - Uses of Penicillin, Chloramphenicol, streptomycin.

5.2 Anesthetic's - General and Local Anesthetic's - Antiseptics - Example and their application. Definition and one example each for analgesics antipyretics, tranquilizers, sedatives, causes for diabetes, cancer and AIDS.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2

MODEL QUESTION PAPER- ALLIED CHEMISTRY-II (17U2ACH2 / 17U4ACH2)

Duration : 3 Hours   **Maximum : 75 Marks**

SECTION-A (10x2=20)

I Answer all questions

1. Write the formula of Hexamine Cobalt(III)Chloride and Potassium hexafluoroferrate(III)

2. What do you mean by chelation?

3. How are carbohydrates classified?

4. How do you prepare glycine by Gabriel's phthalimikde synthesis?

5. State the law of photochemical equivalence.

6. Define the terms a) phase b) component.

7. Define Phase rule.

8. Define photosensitization.

9. Define quantum yield.

10. What is common ion effect?

SECTION-B (5x5=25)

II Answer any five Questions.

11. a) Distinguish between co-ordination number and EAN with suitable examples.

(or)

b) Give the structure of EDTA. Mention any four of its applications.

12. a) How is glucose converted to fructose?

(or)

b) Discuss Dergmann's method of synthesis of peptides.

13. a) Write a note on quantum yield.

(or)

b) Discuss the salient features of phase diagram of water.

14.a) Explain photochemical Hydrogen-Chlorine reaction.

(or)

b) Explain the concept of quantum yield.

15. a) Explain buffer solution and buffer action in biological systems.

(or)

b) Explain the application of phase rule to water system.

PART-C (3x10=30)

III Answer any three Questions.

16. What are the postulates of Werner's theory?

17. What are the biological functions of hemoglobin?

18. Compare the physical and chemical properties of glucose and fructose.

19. Explain a) Fluorescence b)Phosphorescence.

20. What is pH? How would you determine it.

SCHEME OF VALUATION FOR ALLIED CHEMISTRY PRACTICALS

Internal assessment: 25 Marks

External assessment: 75 marks

Total: 100 marks

Max. Marks: 75

Record: 15 Marks

Volumetric Analysis: 30 Marks

Organic Analysis   : 30 Marks

Volumetric Analysis   : 30 Marks (Maximum)

Procedure   : 5 Marks

Error upto 2 %   : 25 Marks

2.1 to 3 %   : 20 Marks

3.1 to 4 %   : 15 Marks

4.1 to 5 %   : 10 Marks

    > 5 %   : 5 Marks

Arithmetic error   : Deduct 1 mark

Wrong calculation   : Deduct 20 % of marks scored

No calculation   : Deduct 40 % of marks scored

Organic Analysis   : 30 Marks

Preliminary Reactions   : 4 Marks

Aliphatic or Aromatic   : 4 Marks

Saturated or unsaturated   : 4 Marks

Tests for 3 elements   : 9 Marks (3 x 3)

Tests for functional group   : 9 Marks.

Course	: B.Sc., / B.A.,	**Semester**	: 4th semester
Subject	: Non-Major Elective - II	**Batch**	: 2017 – 2018 Onwards
Subject code	: 17U4CHNM	**Credit**	: 2

PAPER-I -CHEMISTRY IN EVERYDAY LIFE

OBJECTIVE:

To study the use of chemicals in our day today life,

To study adulterants in food materials, and pharmaceuticl drugs.

UNIT-I

General Survey of Chemicals used in everyday life.
Cosmetics:Talcum Powder, Tooth pastes, Shampoos, Nail Polish, Perfumes, Soaps, and detergents – General formulations and preparation – possible hazards of cosmetics use.

UNIT-II

Food and Nutrition: Carbohydrates, Proteins, Fats, Minerals and Vitamins, definitions, sources and their physiological importance – balanced diet.
Adulterants in milk, ghee, oil, coffee powder, tea, asafetida, chilli powder, pulses and turmeric powder – identification.

UNIT-III

Colour chemicals used in food – soft drinks – and its health hazards.
Chemicals in food production – fertilizers used in natural sources – Fertilizers urea, NPK and Super phosphates need – uses and hazards.

UNIT-IV

Polymer, Polymerisation – Definition and examples- Plastics, polythene, PVC, Bakelite, Polyesters, resins, and their applications. Natural Rubber – Synthetic rubbers – Vulcanization – definition and its applications

UNIT-V

Pharmaceutical drugs – Analgesics and antipyretics – antibiotics – definitions examples and applications. Antiseptics – disinfectants – definitions examples and application.

REFERENCES:
1. Chemical process industries – Norris Shreve Joseph A.Brine .Jr.

2. Perfumes, Cosmeticsand soaps – W.A. Poucher (vol 3).
3. Environmental Chemistry – A.K.DE
4. Industrial Chemistry, B.K.Sharma-Goel publishes & distributors – 2004
5. Food Science –III Edition – B. Srilakshmi – New age international publishers 2005.
6. Food chemistry Lillian Hoagland Meyer – CBS publishes & distributors – 2004

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2

MODEL QUESTION PAPER- CHEMISTRY IN EVERYDAY LIFE (17U3CHNM)

Duration : 3 Hours   **Maximum : 75 Marks**

PART A (10x2=20)

(Answer ALL questions)

1. How shampoo is prepared?
2. What are the Ingredints of Tooth paste?
3. Write the two importance of Protein's.
4. Name the adulterants present in the following.
   i. Tea Power
   ii. Chilli Powder
5. What are the colour chemicals used in food?
6. Write short notes on fertilizers.
7. Define: Polyesters.
8. What is PVC?
9. Write short notes on Antibiotics.
10. Define antiseptics.

SECTION-B (5x5=25)

ANSWER ALL QUESTIONS

11. a. Explain the chemical used in everyday life?
    b. What are detergents? How they are prepared?
12. a. Explain the following terms: 1)Carbohydrates 2)Fats
    b. Explain any one method for determination of adulterant in ghee.
13. a. Write short notes on health hazards using colour chemicals.
    b. Write notes on chemicals used in food production.
14. a. Write short notes on :i)Plastics ii) Polythenes.
    b. Write short notes on natural rubber.
15. a. Write short notes on Antipyretics.
    b. Write short notes on Antiseptics.

SECTION-C (3x10=30 Marks)
Answer any three questions.

16. Discuss the following: (4+3+3)
    i) Nailpolish ii)Soaps iii) Perfumes

17. Discuss the following: i)Minerals ii)Vitamins
18. Discuss the following fertilizers:
    i) Urea ii)NPK iii)Super phosphates.
19. Explain the following: i)Synthetic Rubber ii)Valvanization
20. Discuss. i) Antibiotic ii)Explosives.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
UNDERGRADUATE SYLLABUS UNDER CBCS

Course	: B.Sc., / B.A.,	**Semester**	: 3rd semester
Subject	: Non-Major Elective - I	**Batch**	: 2017 – 2018 Onwards
Subject code	: 17U3CHNM	**Credit**	: 2

PAPER II - MEDICINAL CHEMISTRY

OBJECTIVE:

To study the blood composition, common drugs.

To get an idea of major diseases, different types of treatments of shock.

To study Indian medicinal plants.

UNIT –I: CLINICAL HEALTH AND BIO CHEMICAL ANALYSIS:

Definition of health, WHO standard sterilization of surgical instruments. Biochemical analysis of urine and serum. Blood – composition, grouping and Rh factor**.**

UNIT-II COMMON DRUGS :

Antibiotics, Antipyretics, Analgesics,Anaesthetics,Anti-inflammatory agents, Sedatives, Antiseptics, Antihistamines, Tranquillizers, Hypnotics and Antidepressant drugs-Definitions examples, uses and Side effects.

UNIT-III COMMON AILMENTS AND TREATMENT:

Blood pressure- Hypertension and Hypotension, Diabetes,Cancer, AIDS- causes, symptoms and medicines.

UNIT-IV INDIAN MEDICINAL PLANTS:

Palak, Vallarai, Kizhanelli, Thumbai, Hibiscus, Adadodai, Thoothuvalai , Nochi, Thulasi, Aloevera- Major Chemical Constitutent and medicinal uses.

UNIT-V: FIRST AID AND SAFETY:

Treatment of shock,haemorrage, cuts and wounds. Burns-Classification and first aid. Asbestos, silica, lead paints, cement welding fumes and gases – Hazard alert and precautions for safety.

BOOK FOR REFERENCE

1. Jayashree Ghosh – Applied Chemistry- S.Chand and Company Ltd., 2006

2. S.C.Rastogi, Biochemistry, Tata McGraw Hill Publishing Co., 1993

3. Rasheeduv Zafar – Medicinal Plants of India – CBs Publishers and Distributors, 2000

4. B.L.Oser, Hawk's Physiological Chemistry, Tata –McGraw-Hill Publishing Cp. Ltd.

5. A.H. Beckett and J.B. Stenlake – Practical Pharmaceutical Chemistry, Vol. I-CBS Publishers and Distributors, 2000.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2

MODEL QUESTION PAPER- - MEDICINAL CHEMISTRY (17U4CHNM)

Duration : 3 Hours   **Maximum : 75 Marks**

PART A (10x2=20Marks)

Answer all questions

1. Define: Health
2. What is Rh Factor? What are its significance?
3. What is Antiseptic drugs? Give and example?
4. What are the uses of sedative drugs?
5. Indicate the Symptoms of hypertension?
6. What is blood pressure?
7. Mention the uses of Thulasi?
8. Mention the uses of Thoothuvalai?
9. What is first aid?
10. Write the harmful effect of paint dust?

SECTION-B (5x5=25Marks)

Answer all questions

11. a. Explain biochemical analysis of urine?
    b. give a brief account of sterllization?
12. a. Define Antibiotice" Write the uses and side effects of any two Antibiotic?
    b. Write notes on antidepressant drugs?
13. a. Explain the causes of cancer? How is it generally treated?
    b. Give a brief account of hypotension.
14. a. Mention the Chemical composition and uses of Kizhanelli?
    b. Write notes on vallarai.
15. a. Mention the Hazards of Welding Fumes?
    b. Explain the first aid treatment for shock and burns?

SECTION-C (3x10=30 Marks)

Answer any three questions

16. Describe the Composition of blood.
17. Write notes on i) Antipyretics' ii)Analgesics iii)Tranquilizers.
18. How is AIDS caused? What are the Symptoms? How will you prevent?
19. Describe the chemical constituents and medicinal uses of Hibiscus and Adadodai.
20. Discuss the following
    i) Silica Hazards
    ii) Asbestos Hazards.
    iii) Lead Hazards.

MUTHURANGAM GOVT.ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
POSTGRADUATE SYLLABUS UNDER CBCS

M.SC.,CHEMISTRY SYLLABUS
FOR CANDIDATES ADMITTED FROM 2017-2018 ONWARDS
MARCH-2017

MUTHURANGAM GOVT ARTS COLLEGE (AUTONOMOUS) , VELLORE- 632002

M.Sc., CHEMISTRY

(CBCS PATTERN) (WITH EFFECT FROM 2017)

THE COURSE OF STUDY AND THE SCHEME OF EXAMINATIONS

S.No	SEMESTER	SUBJECT CODE	SUBJECT	Ins..Hrs/ week	credit	Exam hrs	IA	Ext	Total
1	1	172P1CH1	ORGANIC CHEMISTRY -I	5	5	3	25	75	100
2	1	17P1CH2	INORGANIC CHEMISTRY- I	5	4	3	25	75	100
3	1	17P1ECH1	PHYSICAL CHEMISTRY- I	5	5	3	25	75	100
4	2	P172CHPR1	ORGANIC CHEMISTRY PRACTICAL- I	4	-	-	-	-	-
5	2	17P2CHPR2	INORGANIC CHEMISTRY PRACTICAL -I	4	-	-	-	-	-
6	2	17P2CHPR3	PHYSICAL CHEMSITRY PRACTICAL -I	4	-	-	-	-	-
1	2	17P2CH3	ORGANIC CHEMISTRY- II	5	4	3	25	75	100
2	2	17P2CH4	INORGANIC CHMEISTRY -II	5	4	3	25	75	100
3	2	17P2ECH	PHYSICAL CHEMISTRY- II	5	5	3	25	75	100
4	2	17P2HR	HUMAN RIGHTS	3	2	3	25	75	100
5	2	P172CHPR1	ORGANIC CHEMISTRY PRACTICAL- I	4	4	6	25	75	100
6	2	17P2CHPR2	INORGANIC CHEMISTRY PRACTICAL -I	4	4	6	25	75	100
7	2	17P2CHPR3	PHYSICAL CHEMSITRY PRACTICAL -I	4	4	6	25	75	100
1	3	17P3CH5	ORGANIC CHEMISTRY- III	4	4	3	25	75	100
2	3	17P3CH6	INORGANIC CHMEISTRY – III	4	4	3	25	75	100

3	3	17P3CH7	PHYSICAL CHEMSITRY - III	4	4	3	25	75	100
4	3	17P3CH8	ADVANCED CHEMISTRY	4	4	3	25	75	100
5	3	17P3ECH	SCIENTIFIC RESEARCH METHODOLOGY	2	2	3	25	75	100
6	4	17P4CHPR4	ORGANIC CHEMISTRY PRACTICAL-II	5					
7	4	17P4CHPR5	INORGANIC CHEMISTRY ORACTICAL-II	5					
8	4	17P4CHPR6	PHYSICAL CHEMISTRY PRACTICAL-II	6					
1	4	17P4CH9	ORGANIC CHEMISTRY -IV	5	5	3	25	75	100
2	4	17P4CH10	INORGANIC CHEMISTRY -IV	5	5	3	25	75	100
3	4	17P4CH11	PHYSICAL CHEMSITRY-IV	5	5	3	25	75	100
4	4	17P4ECH	APPLIED CHEMISTRY	4	4	3	25	75	100
5	4	17P4CHPR4	ORGANIC CHEMISTRY PRACTICAL-II	5	4	6	25	75	100
6	4	17P4CHPR5	INORGANIC CHEMISTRY ORACTICAL-II	5	4	6	25	75	100
7	4	17P4CHPR6	PHYSICAL CHEMISTRY PRACTICAL-II	6	4	6	25	75	100
			TOTAL	120	90				2200

RESOLUTION OF BOARD OF STUDIES IN POSTGRADUATE COURSE

IN CHEMISTRY

The board of Studies in Postgraduate Chemistry have scrutinised the syllabus for Ist Semester to IVth Semester papers of M.Sc.,Chemistry Course held on the FN of 23-03-2017 and resolved the following

The Board resolved to approve and pass syllabus for Postgraduate course on Chemistry for Ist semester to IVth semester theory and practical

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
POST-GRADUATE SYLLABUS UNDER CBCS

Course	: M.Sc. Chemistry	Semester	: 1st semester
Subject	: Organic Chemistry-I	Batch	: 2017 – 2018 Onwards
Subject code	: 17P1CH1	Credit	: 5

OBJECTIVES:

To learn the concepts of stereochemistry, conformational analysis and their application in the determination of reaction mechanism.

To understand the mechanism of Nucleophilic and electrophilic substitution reactions.

Unit I

Chirality-conditions for optical activity asymmetry and dissymmetry-dissymmetry of allenes, biphenyls, and molecules with helical structures-absolute configuration-D/L and R/S notation of acyclic chiral molecules, allenes, biphenyls and spiro compound. Erythro/threo-meso/dl configuration –prochiral centre- asymmetric synthesis- Crams rule- optical purity. Homotopic, enantiotopic, and diastereotopic.

Unit II

Geometrical isomerism: E-Z nomenclature of olefins and oximes- Geometrical and optical isomerism of mono and disubstituted cyclopropane, cyclobutane, cyclopentane and cyclohexane derivatives.

Conformation and conformational analysis- conformation of simple disubstituted ethane derivatives – cyclohexane derivatives – conformational free energy – conformation and stereochemistry of decalins and 9-methyl decalin.

Unit III

Nucleophilic substitution reactions: S_N^1, S_N^2 and S_N^i mechanisms - Neighboring group participation - reactivity, structural and solvent effects - substitution in norbornyl and bridgehead systems - substitution at allylic and vinylic carbons - substitution by ambident nucleophiles - substitution at carbon doubly bonded to oxygen and nitrogen - alkylation and acylation of amines, halogen exchange, Von-Braun reaction, alkylation and acylation of active methylene carbon compounds, hydrolysis of esters, Claisen and Dieckmann condensation.

Unit IV

Aromatic Nucleophilic substitution: Benzyne mechanism- reactions of aryne intermediate. Aromatic Nucleophilic substitution of activated halides. Ziegler alkylation. Chichibabin reaction.

Electrophilic substitution reactions: S_E^1, S_E^2 and S_E^i mechanism, double bond shift - Reactivity. Migration of double bond, keto-enol interconversion, Stark- Enamine reaction, halogenation of aldehydes and ketones and decarboxylation of aliphatic acids.

Unit V

Aromatic electrophilic substitution:

The arenium ion mechanism. Orientation and reactivity (Ortho, meta and para directing groups). Typical reactions to be studied- nitration, halogenations, alkylation, acylation and diazonium coupling. Formylation reactions- Gatterman, Gatterman-koch, Vilsmeyer- Hack and Reimer- Tiemann reactions. Electrophilic substitution of furan, pyrrole, thiophene, pyridine, pyridine-N-oxide, naphthalene and anthracene.

<u>**Reference Books:**</u>

1. Organic Synthesis by R.O.C. Norman, Chapman and Hall, NY, (1980)

2. Physical Organic Chemistry by Niel Isaacs, ELBS Publications (1987)

3. Organic Reaction Mechanism by S.M. Mukherji and S.P. Singh, MacMillan India Ltd., Chennai (1990)

4. Organic Chemistry IV Edition by Stanley Pines

5. Structures and Mechanism by E.S. Gould

6. Advanced Organic Chemistry, Part A and B, by Francis A. Carey and Richard J. Sundberg, 3rd Edition (1990), Plenum Press.

7. Aromatic Nucleophilic Substitution by J. Miller

8. Advanced Organic Chemistry III Edition by J. Miller

9. Reactive Molecules, C. Wentrup, John Wiley and Sons, New York (1984)

10. Advanced organic reaction mechanism and structure by J. March, Tata McGraw Hill.

11. Organic Chemistry, Marc London

12. Organic Chemistry, Mc Murray

13. Organic Chemistry, Graham Solomons

14. Carbenes, Nitrenes and Arynes by T.L. Gilchrist and C.W. Rees, Thomas Nelson and Sons Ltd., London.

15. Stereochemistry, Conformation analysis and Mechanism by P.S. Kalsi, 2nd Edition (1993), Wiley Eastern Limited, Chennai.

16. Stereochemistry of carbon compounds by Ernest Eliel

17. Stereochemistry and Mechanism through solved problems by P.S. Kalsi. Wiley Eastern Ltd., (1994)

18. Basic principles of Organic Stereochemistry by P. Ramesh - Madurai Kamaraj University.

19. Organic Reaction Mechanism by R.K. Bansal.

20. A Guide book to mechanism in organic chemistry by Longman.

21. Structure and mechanism in organic chemistry by C.K. Ingold, cornell University press.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2

**MODEL QUESTION PAPER-
ORGANIC CHEMISTRY-1
(17P1CH1)**

Duration : 3 Hours   **Maximum : 75 Marks**

Answer all the questions

1. a) State and explain Cram's rule.
             OR
    b) Write short notes on disymmetry of allenes, biphenyls, paracyclophanes.

2. a) Draw the fischer projection for threo-2-bromo-3-chlorobutane and convert
    it in to Newman and Sawhorse representations.
             OR
    b) Explain the conformation and stereochemistry of cis- and trans-Decalins .

3. a) Explain S_ni mechanism with suitable examples.
             OR
    b) Write a short note on Taft equation.

4. a) Write notes on Vilsmeyer- Hack reaction.
             OR
    b) Write notes on Riemer Tiemen reaction.

5. a) Methyl chloride reacts faster than tert-butyl chloride under S_n2 condition.
    Explain.
             OR
    b) What are ambident nucleophiles? Give examples.

SECTION – B (3X15=45 Marks)
Answer any THREE questions

6. a) Discuss optical activity due to helicity.
    b) Explain asymmetry synthesis using chiral catalyst and chiral substrate
7. Taking examples of some cyclohexane derivatives discuss the effect of conformation on chemical reactivity
8. Write short notes on the following
        a) S_n1 mechanism
        b) E_1CB mechanism
        c) Hammett equation
9. Explain the following
        a) Arenium ion mechanism
        b) Gattermann reaction
        c) Gattermann Koch reaction
10. Write a note on following
        a) Streochemistry of substitution reaction
        b) Solvent Effect
        c) Von Braun reaction

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
POSTGRADUATE SYLLABUS UNDER CBCS

Course	: M.Sc. Chemistry	Semester	: 1st semester
Subject	: Inorganic Chemistry-I	Batch	: 2017 – 2018 Onwards
Subject code	: 17P1CH2	Credit	: 4

OBJECTIVES:

To study about chemical bonding, chemistry of main group elements, HSAB concept.
To learn about nuclear chemistry, polarography and amperometeric titrations

UNIT- I

Chemical Bonding- VSEPR model, shapes of molecules - ClF_3, ICl_4^-, TeF_5^-, I_3^-, $TeCl_6^{2-}$, $SbCl_6^{3-}$, ReF_7, XeF_8^{2-}, TaF_8^{3-}; Bent rules and energetics of hybridization; electronegativity and partial ionic character.

Lattice energy: Born-Lande equation, polarizability and partial covalent character, radius-ratio rules, structures of simple solids, Zintl- isoelectronic relationship in solids. Molecular orbital theory: LCAO and MO diagrams of heteronuclear diatomic (CO, NO, HF, ICl).

M-M bond and metal atom clusters, halide clusters, bonding in $[ReCl_8]^{2-}$. Metal carbonyl clusters- LNCC's and HNCC's. Electron counting in carbonyl clusters.

UNIT- II

Chemistry of main group elements- preparation, structure and bonding in boranes, carboranes, metallocarboranes, Wades rules, borazines (N-B), phosphazenes (N-P), sulpurnitrogen cyclic compounds.

Silicates- Classification, structures, isomorphous replacement, layered and zeolites.

UNIT-III

HSAB concept: Basis of HSAB concept, acid-base strength, hardness and softness, applications of HSAB concept; Acid- base concept in non-aqueous media, reactions in BrF_3, N_2O_4, anhydrous H_2SO_4, CH_3COOH. Isopoly and heteropoly acids of W, Mo and V, preparations, properties, structure and applications.

Stereoisomerism- Chirality, optical activity- CD, ORD, Cotton effect, absolute configuration of metal complexes.

UNIT-IV

Nuclear Chemistry-The atomic nucleus-elementary particles, classification of nuclides based on Z and N values, nuclear stability, nuclear potential, binding energy. Nuclear Models: Shell model-salient features, forms of the nuclear potential, filling of orbitals, nuclear configuration, Liquid drop model, Fermi gas model, Collective model and Optical model. Radioactivity, radioactive decay kinetics, Parent-daughter decay-growth relationship-secular and transient equilibria, theories of α, β-, β+ and γ-decay, internal conversion, Auger effect.

UNIT-V

Polarography: Theory – apparatus –DME- Diffusion, kinetics and catalytic currents- current –voltage curves for reversible and irreversible systems –Quality and Quantitative applications to inorganic systems

Amperometric titrations: Theory –apparatus-Types of titration curves – successive titration curves – successive titrations and indicator electrodes-application- Cyclic voltammeter- theory, application to inorganic systems –thermal methods, DTA, TGA, and DSC instrumentation and applications.

SUGGESTED BOOKS

1. Basic Inorganic Chemistry- F. A. Cotton, G. Wilkinson and P. L. Gaus; John Wiley

and sons. Inc, 6th edition (1999).
2. Advanced Inorganic Chemistry, 6th edition; F. A. Cotton and G. Wilkinson.
3. Inorganic Chemistry IV edition; J. E. Huheey, E. A. Keiter and R. L. Keiter, Addison; Wesley (1993).
4. Inorganic Chemistry, II edition, D. F. Shriver, P. W. Atkins and C. H. Langford, ELBS; Oxford University Press, 1994.
5. Chemistry of elements; N. N. Greenwood and A. E. Earnshaw, Butterworth Heinemann (1997).
6. Concise Inorganic Chemistry, 5th edition; J. D. Lee (1996).
7. Essentials of nuclear chemistry, 4th edition; H. J. Arniker, NAIL publishers (1995); Chapters 1, 3 and 4.
8. Nuclear and Radioactive chemistry; Friedlander, Kennedy and Miller; Chapters 8 and 9.
9. Inorganic Chemistry, 3rd Edition; Gary. L. Miessler and Donald . A. Tarr (2007).

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2

MODEL QUESTION PAPER-INORGANIC CHEMISTRY-1 (17P1CH2)

Section A (5 x 6 = 30 marks)

Answer all questions

1. a) Predict the geometries of ReF_7, XeF_8^{2-} and TaF_8^{3-} molecules using VSEPR theory.

         Or

    (b) Explain Bent rules and energetics of hybridization

2. a) Discuss the structure and properties of borazole.

         Or

    b) Write a short note on zeolites.

3. a). Write a short note on homopoly and heteropoly acids.

         Or

    b) Discuss the HSAB concept.

4. (a) Explain liquid drop model

         Or

    (b) Discuss binding energy and auger effect

5. (a) Write an account of DME

         Or

    (b) Explain cyclic voltammeter

Section B (3 x 15 = 45 marks)

Answer any three questions

6. Discuss the preparation of, structures of and bonding in $Re_2Cl_8^{2-}$.

7. a) Discuss the preparation of, structure of, and bonding in $N_3P_3Cl_6$.

8. Explain the following terms (a) ORD, (b) cotten effect and (c) chirality.

9. Discuss the Fermi gas model, collective and optical model.

10. Discuss principle of, instrumentation details of and application of TGA

Course	**: M.Sc. Chemistry**	**Semester**	**: 1st semester**
Subject	**: Physical Chemistry-I**	**Batch**	**: 2017 – 2018 Onwards**
Subject code	**: 17P1ECH1**	**Credit**	**: 5**

OBJECTIVE:

To study the partial molar property, fugacity and its significance. Theories and basic concepts of chemical kinetics - mechanism of acid, base and enzyme catalysis reaction. To acquire knowledge on phase equilibria of three component system. To study the basics of colloids.

UNIT-I: THERMODYNAMICS

Partial molar properties -Partial molar free energy (chemical potential), Partial molar volume and Partial molar heat content - Their significance and determination of these quantities. Variation of chemical potential with temperature and pressure.

Definition of fugacity - determination of fugacity by graphical method - variation of fugacity with temperature and pressure - the concept of activity and activity coefficients – determination of activity and activity coefficient by emf method - determination of activity and activity coefficients for non-electrolytes - determination of standard free energies - choice of standard states.

UNIT-II: PHASE EQUILIBRIA

Physical equilibria involving phase transition: Two component system - Congruent system (phenol-aniline) and Incongruent system (sodium chloride- water) - Peritectic reactions. Three component system: Solid - Liquid equilibria - hydrate formation (sodium chloride - sodium sulphate - water); Liquid - Liquid equilibria - one pair of partially miscible liquids (acetic acid - chloroform - water and alcohol - benzene - water); two pairs of partially miscible liquids (water - ethyl alcohol - succinic nitrile).

UNIT-III: COLLOIDS

Surface phenomena - surfactants, micellization, critical micelle concentration (CMC), factors affecting CMC of surfactants, micro emulsions, reverse micelles and surface films (electro kinetic phenomena).

Structure and stability of colloids - Zeta potential (derivation), electro osmosis, protective colloids, gold number, sedimentation potential, streaming potential and Donnan membrane equilibrium.

UNIT-IV: CHEMICAL KINETICS

Absolute Reaction Rate Theory (ARRT) - Potential energy surfaces - partition function and activated complex- Eyring equation - estimation of free energy, enthalpy and entropy of activation and their significance.

Reactions in solutions - effect of pressure, dielectric constant and ionic strength on reactions in solutions - kinetic isotope effects - linear free energy relationships. Hammett and Taft equation.

UNIT-V: CATALYSIS

Acid - Base catalysis - mechanism of acid - base catalyzed reactions - Bronsted catalysis law. Catalysis by enzymes - Kinetics of enzyme catalyzed reaction - Michaelis - Menten equation and its interpretation. Effect of substrate concentration, pH and temperature on enzyme catalyzed reactions - inhibition of enzyme catalyzed reactions - Competitive, Non-competitive and Uncompetitive inhibition.

TEXT BOOKS

1. S. Glasstone, Thermodynamics for Chemists, Affiliated East West Press, New Delhi (1950).
2. J. Rajaram and J. C. Kuriacose, Thermodynamics for Students of Chemistry, Lal Nagin Chand, New Delhi (1986).
3. Samuel Glasstone, Textbook of Physical Chemistry, Macmillan India Limited, 2nd Edition
4. Terence Cosgrove – Colloid Science - Principles, methods and applications
5. Robert J. Hunter - Foundations of Colloid Science, 2nd Edition
6. J. Rajaram and J.C. Kuriacose, Kinetics and Mechanism of Chemical Transformations. Mac Millan India Ltd (1993).
7. K. J. Laidler, Chemical Kinetics, Harper and Row, New York (1987).

Suggested References

1. W. J. Moore, Physical Chemistry, Orient Longman, London (1972).
2. K. G. Denbiegh, Thermodynamics of Steady State, Methien and Co. Ltd, London (1951).
3. K. Nash, Elements of Chemical Thermodynamics, Addision Wesley (1962).
4. Alexander and Johnson- "Colloid science"- Oxford University Press
5. R. G. Frost and Pearson, Kinetics and Mechanism, Wisely, New York (1961).
6. Amdur and G. G. Hammes, Chemical Kinetics, Principles and Selected Topics, McGraw Hill, New York (1968).
7. M.V. Sangaranarayanan and V. Mahadevan, Text book of Physical Chemistry, University press (2011).

Course	: M.Sc. Chemistry	**Semester**	: 2nd semester
Subject	: Organic Chemistry-II	**Batch**	: 2017 – 2018 Onwards
Subject code	: 17P2CH3	**Credit**	: 4

OBJECTIVES:

To learn the various types of reactions, rearrangements and their synthetic utility.

Unit - I

Elimination reactions:

E^1, E^2 and E^{1CB} mechanism – Hoffmann and Saytzeff rule – Factors affecting elimination, elimination vs substitution. Regiochemistry of elimination reaction – Stereochemistry of E^2 eliminations in open chain and cyclohexane systems. Mechanism of pyrolytic eliminations. Hoffmann, Chugaev and Cope eliminations.

Unit – II

Addition reactions

Addition to carbon-carbon multiple bonds, Mechanism, regioselectivity and stereochemistry of addition of O_3, X_2, HX, H_2O, $Hg(OAc)_2$ and boranes to alkenes and alkynes. Carbenes and their addition to double bonds – Simmon Smith reaction.

Unit - III

Addition to carbon-oxygen bond (acyclic and cyclic systems should be dealt). Addition to hydrides ($NaBH_4$, $LiAlH_4$), Addition to carbon nucleophiles – cyanide, Grignard reagens, organo lithium, organo Tellurium, Condensation reactions: Aldol, Knovenegal, Claisen, Perkin, and Wittig reactions Formation of imines, hydrazones and oximes.

Unit-IV

Molecular rearrangements:

A detailed study with suitable examples of the mechanism with stereochemistry of the following rearrangements: Pinacol-Pinacolone – Wagner-Meerwein, Demjanov, dienone-phenol, Favroski, Baeyer-Villiger, Wolf, Wittig, Neber, Stevens, Hoffmann, Lossen, Curtius, Beckmann, Benzidine (in open chain and cyclic systems) and Von Richter rearrangement. (A few examples in each rearrangement to be studied).

Unit – V

Oxidation and Reduction

Oxidation with chromium(VI), modified chromium(VI) oxidants (PCC, PDC, Jones, Collins), DMP, manganese dioxide, dimethyl sulphoxide, potassium permanganate, osmium tetraoxide, selenium dioxide and sharpless epoxidation, DDQ.

Reductions using borane, 9-BBN, DIBAL, LAH and borohydrides. Birch reduction, Wolf-kishner reduction and Clemmenson reduction.

Reference Books:

1. Principles of organic synthesis R.O.C. Norman, Chapman and Hall, London. 1980.

2. Structure and Mechanism by E.S. Gould

3. Advanced Organic Chemistry - Part B by Francis A. Carey and Richard J, Sundberg, 3rd Edition 1990.

4. Organic Reaction Mechanism by S.M. Mukherji and S.P. Singh, MacMillan India Ltd., Chennai - 1990.

5. Organic synthesis by Michael Smith.

6. Carbenes, Nitrenes and Arynes by T.L. Gilchrist and C.W. Rees, Thomas Nelson and Sons Ltd., London.

7. Molecular Rearrangements Vol-I and Vol-II by Paul de Mayo.

8. Advanced Organic Chemistry III Edition by J. March.

9. Stereochemistry and Mechanism through solved problems by P.S. Kalsi, Wiley Eastern Ltd., 1994.

10. Some Modern Methods of Organic Synthesis by W Carruthers, III Edition, Cambridge University Press, 1993.

11. Modern Synthetic Reactions by H.O. House, The Benjamin Cummings Publishing Company, London, 1972

12. Advanced organic chemistry, Mc Murray, Thomas Pvt. Ltd.,

13. Organic reaction mechanisms: Parmer and Chawla, S. Chand and Co.,

Duration : 3 Hours   **Maximum : 75 Marks**

SECTION – A (5x6=30 Marks)

Answer all the questions

1. a) Explain Hofmann elimination.
              OR
    b) Explain pyrolytic elimination.

2. a) Write a note on Carbenes.
              OR
    b) Write a note on Simon smith reaction.

3. a) Write a note on Wittig reaction.
              OR
    b) Write a note on Hydroboration.

4. a) Explain Baeyer-Villiger rearrangement.
              OR
    b) Explain Fries rearrangement.

5. a) Explain Birch reduction.
              OR
    b) Explain Wolf-kishner reduction

SECTION – B (3X15=45 Marks)

Answer any three questions

6. a) Explain E_2 mechanism with suitable examples.

    b) Explain Chugaev elimination and Cope elimination

7. Write short notes on the following
              a) Michael addition
              b) Mannich reaction
              c) Simmon-Smith reaction

8. Explain the following with suitable mechanism
              a) Aldol condensation
              b) Knovenegal reaction
              c) Claisen Condensation
              d) Perkin reaction
              e) Grignard reagents

9. Explain the rearrangement to electron deficient carbon with suitable examples
10. Explain oxidation using Osmium tetraoxide, Potassium permanganate and DMSO
    and reduction using BBN, DIBAL and LAH.

Course	: M.Sc. Chemistry	**Semester**	: 2nd semester
Subject	: Inorganic Chemistry-II	**Batch**	: 2017 – 2018 Onwards
Subject code	: 17P2CH4	**Credit**	: 4

Objective

To study about metal-ligand equilibria in solution and metal-ligand bonding. To learn about magnetic properties of coordination compounds, photochemical reactions of transition metals complexes and chromatography.

UNIT-I

Metal-Ligand equilibria in solution- Step-wise and overall formation constant and their relationship, trends in step-wise constant, kinetic and thermodynamic stability of metal complexes, factors affecting the stability of metal complexes with reference to the nature of the metal ion and ligand, chelate effect, macrocyclic effect and their thermodynamic origin. Determination of binary formation constant by pH metry, spectro photometry and ion exchange methods.

Structure and bonding- Structure and bonding in hydride, dihydrogen, dioxygen, isocyanide, CO, NO, N_2, CO_2 and tertiary phosphine complexes of transition metals.

UNIT-II

Metal- ligand bonding- Stereoisomerism- coordination numbers 3 to 8. Crystal field theory, salient features, spectrochemical series, splitting of d-orbital's in tetragonal, square planar, trigonal bipyramidal and square-pyramidal geometry, applications of CFT- colours of transition metal complexes, magnetic properties of octahedral complex, distortion of octahedral complex, CFSE and their uses, factors affecting CFSE, limitations of CFT, experimental evidence for metal-ligand covalent bonding in complexes, nephelauxetic effect

Ligand Field Theory, MO theory: tetrahedral and octahedral complexes (including π- bonding), angular overlap model.

UNIT-III

Electronic spectra of coordination compounds- Spectroscopic ground states, selection rules, term symbols for d^n ions, Racah parameters, Orgel, Correlation and Tanaube-Sugano diagrams, spectra of 3d metal-aqua complexes of trivalent V, Cr, divalent Mn, Co and Ni, $CoCl_4^{2-}$, calculation of Dq, B and β parameters, CT spectra and Jahn-Teller distortion.
Spectral properties of Lanthanide and Actinide metal complexes.

UNIT-IV

Magnetic properties of coordination compounds- Types of magnetic behaviour, magnetic susceptibility and its determination- Gouy, Faraday, VSM method. Diamagnetic correction, orbital contribution, spin-orbital coupling, ferro - and antiferromagnetic coupling, spin-crossover. Magnetic properties of Lanthanide and Actinide metal complexes.

Photochemical reactions of transition metals complexes: Basic photochemical processes, Kasha's rule, quantum yield, Jabolnskii diagrams, photo substitution reactions, photo-redox reactions, ligand photoreactions, photoreactions and solar energy conversion.

UNIT-V

Chromatography: Gas, liquid chromatography, principle, Instrumentation, carrier gas, columns, preparations, stationary phase, detectors, thermal conductivity, flame ionization,

High Performance liquid chromatography, scope, column efficiency, instrumentation, pumping system, columns, column packing, detectors, applications.

SUGGESTED BOOKS

1. Basic Inorganic Chemistry- F. A. Cotton, G. Wilkinson and P. L. Gaus; John Wiley and sons. Inc, 6th edition (1999).
2. Chemistry of elements- N. N. Greenwood and A. E. Earnshaw, Butterworth Heinemann (1997).
3. Inorganic Chemistry IV edition; J. E. Huheey, E. A. Keiter and R. L. Keiter, Addison; Wesley (1993).
4. Inorganic Chemistry, II edition, D. F. Shriver, P. W. Atkins and C. H. Langford, ELBS; Oxford University Press, 1994.
5. Inorganic Electronic spectroscopy, A. B. P. Lever, Elsevier. (1968).
6. Magnetochemistry, R.L. Carlin, Springer Verlag.
7. Electronic Absorption Spectroscopy and related Techniques, D. N. Sathyanarayana, University Press (2001).
8. Inorganic Chemistry A Unified Approach by W. W. Porterfield, Elsevier 2005 2nd edition.
9. Textbook of inorganic chemistry by G. S. Sodhi, Viva books Pvt. Ltd (2011).
10. The Organometallic Chemistry of the Transition Metal, R.H. Crabtree, John Willey.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2

**MODEL QUESTION PAPER-
INORGANIC CHEMISTRY-1I
(17P2CH4)**

Duration : 3 Hours   **Maximum : 75 Marks**

Section A (5 x 6 = 30 marks)

Answer all questions

1.   (a) Describe the overall formation constant and chelate effect.
                      Or
        (b) Explain macrocyclic effect

2.   (a) Explain magnetic properties of octahedral complex.
                      Or
        (b) Describe Nephelauxetic effect

3.   (a) Discuss optical properties of lanthanide and actinide metal complexes.
                      Or
        (b) Explain Racah parameter and β parameters.

4.   (a) Explain VSM method
                      Or
        (b) Discuss Jabolnskii diagrams

5.   (a) Describe basic principle of liquid chromatography
                      Or
        (b) Explain carrier gas and stationary phases

Section B (3 x 15 = 45 marks)
Any three questions

6.   Discuss structure and bonding nature in isocyanide, dioxygen and N_2 of transition metals.

7.   Discuss LFT and MO theory.

8.   Describe the Jahn-Teller distortion.

9.   Explain the following terms (a) spin-ortial coupling, ferro and anitoferromagnetic coupling.

10.   Discuss high performance liquid chromatography

Course	: M.Sc. Chemistry	**Semester**	: 2nd semester
Subject	: Physical Chemistry-II	**Batch**	: 2017 – 2018 Onwards
Subject code	: 17P2ECH	**Credit**	: 5

OBJECTIVES:

To understand the behavior of kinetic reactions and fast reaction. To understand the behavior of electrolytes in solution. To know the structure of the electrode surface. To differentiate electrode kinetics from other types of kinetic studies. To know the applications of electrode process. To study the concept and applications of group theory.

UNIT-I: KINETICS OF COMPLEX REACTIONS & FAST REACTIONS

Kinetics of complex reactions, reversible reactions, consecutive reactions, parallel reactions, chain reactions, general treatment of chain reactions - chain length - Rice Herzfeld mechanism - explosion limits.

Study of fast reactions - relaxation methods - temperature and pressure jump methods-stopped flow and flash photolysis methods.

UNIT-II: ELECTROCHEMISTRY – I

Mean ionic activity and mean ionic activity coefficient - activity coefficient of strong electrolytes - determination of activity coefficient by electrochemical method.

Debye Huckel limiting law - qualitative and quantitative verification - limitation - Debye Huckel limiting law at appreciable concentrations of electrolytes - Debye - Huckel - Bronsted equation.

UNIT-III: ELECTROCHEMISTRY – II

Electrode - electrolyte interface - adsorption at electrified interface - electrical double layer - electro capillary phenomenon - Lippmann equation - Structure of double layers - Helmholtz - Perrin, Guoy - Chapman and Stern model of electrical double layers.

Diffusion - Fick's law of diffusion - Effect of ionic association on conductance-electro kinetic phenomena -membrane potential.

UNIT-IV: GROUP THEORY – I

Definition of basic terms in group theory – Group – Abelian group, cyclic group, subgroup, group multiplication table - similarity transformation and class, symmetry elements and symmetry operations -Point groups (any examples limited to n = 4 of C_{nv}, C_{nh}, D_{nh}, D_{nd}, & T, T_d, O, O_h), Reducible and Irreducible representations - direct product representation. Character Table - explanation of various column and Mulliken Symbol.

UNIT-V: GROUP THEORY – II

Orthogonality theorem and its consequences - construction of character table for C_{2v}, C_{3v}, C_{2h}, and D_{2d} point groups - hybrid orbitals in nonlinear molecules (CH_4, BF_3, and NH_3). Determination of representations of vibrational modes in nonlinear molecules (H_2O, NH_3, BF_3 and $[PtCl_4]^{2-}$). Symmetry selection rules of Infra-red and Raman spectra.

TEXT BOOKS

1.   J. Rajaram and J. C. Kuriacose, Kinetics and Mechanism of Chemical Transformations. Mac Millan India Ltd (1993).
2.   K. J. Laidler, Chemical Kinetics, Harper and Row, New York (1987).
3.   K. L. Kapoor, A text book of Physical Chemistry, Mac Millan India Ltd., (2001).
4.   S. Glasstone, Introduction to Electrochemistry, Affiliated East West Press, New Delhi (1960).
5.   D. R. Crow, Principles and Applications to Electrochemistry, Chapman and Hall (1991).
6.   K.V. Raman, Group Theory and its Applications to Chemistry, Tata Mc Graw Hill Publishing Co., (1990).
7.   P. K. Bhattacharya, Group Theory and its Applications, Himalaya Publishers.
8.   K.V. Ramakrishnan and M. S. Gopinath, Group Theory in Chemistry, Vishal Publications (1998).

SUGGESTED REFERENCES

1.   R. G. Frost and Pearson, Kinetics and Mechanism, Wisely, New York (1961).
2.   C. Capellos and B. H.J. Bielski, Kinetic Systems, Wisely Interscience, New York (1972).
3.   Amdur and G.G. Hammes, Chemical Kinetics, Principles and Selected Topics, McGraw Hill, New York (1968).
4.   G. M. Harris, Chemical Kinetics, D. C. Health and Co., (1966).
5.   J. Robbins, Ions in Solution - An Introduction of Electrochemistry, Clarendon Press, Oxford (1972).
6.   John O. M. Bockris, Amulya K.N. Reddy, Modern Electrochemistry 2B: Electrodics in Chemistry, Engineering, Biology and Environmental Science
7.   F. A. Cotton, Chemical Applications of Group Theory, John Wiley and Sons inc., New York (1971).
8.   N. Thinkham, Group Theory and Quantum Mechanics, McGraw Hill Book Company, New York (1964).
9.   S. Schonland, Molecular Symmetry, Vannostrand, London (1965).
10.   Alan Vincent, Molecular Symmetry and Group Theory-Programme Introduction to Chemical Application, Wiley, New York (1977).
11.   S. Swarnalakshmi, T. Saroja and R. M. Ezhilarasi, A simple Approach to Group Theory in Chemistry, University press (India) private Ltd (2008).

Course	: **M.Sc. Chemistry**	**Semester**	: **2nd semester**
Subject	: **Human Rights**	**Batch**	: **2017 – 2018 Onwards**
Subject code	: **17P2HR**	**Credit**	: **2**

Basic Concept

a) Human Values- Dignity, Liberty, Equality , Justice, Unity in Diversity, Ethics and Morals.

b) Basic Human Rights values, Rule of law and protection of Human Rights.

c) Meaning and significance of Human Rights Education.

UNIT I: NATURE AND SCOPE OF HUMAN RIGHTS

Meaning of Human Rights, Types and importance of study of Human Rights, Scope and Limitations of the study of Human Rights. Teaching in the formal mode, Non - formal training, Awareness generation, Counseling, Areas of research in Human Rights extension,

UNIT II: CONCEPT OF RIGHTS

Concepts of liberty, freedom, equality, justice and human dignity, Concepts of individual and collective, state, civil society, power and immunity, Relation between rights and Duties. Definition of Human Rights - Nature, Content, Legitimacy and Priority - Theories on Human Rights - Historical Development of Human Rights.

UNIT III: IMPORTANCE OF HUMAN RIGHTS AND DUTIES EDUCATION

Need for and importance of Human Rights education in the promotion and protection of Human Rights . Objectives of Human Rights and Duties education. Factors promoting Human Rights Education - Positive attitudes – Pro - social behaviour - elimination of prejudice and promotion of peace.

UNIT IV : CONTENT OF HUMAN RIGHTS EDUCATION

Basic Human Rights values, Rule of law and protection of Human Rights, Information on Violations, Social responsibility in Human Rights, Human nature , Different Interpretations
Limitation of Human Rights Education. Protection of Human Rights Act, 1993.

UNIT V : STATE OF HUMAN RIGHTS EDUCATION

Contemporary Issues on Human Rights: Children's Rights - Women's Rights -Dalit's Rights - Bonded Labour and Wages -. Refugees - Capital Punishment. Fundamental Rights in the Indian Constitution - Directive Principles of State Policy - Fundamental Duties - National Human Rights Commission.

REFERENCE BOOKS

1. Desai, A.R. - Violation of Democratic Rights in India

2. Pandey - Constitutional Law.

3. Timm. R.W. - Working for Justice and Human Rights.

4. J.C.Johari - Human Rights and New World Order.

5. G.S. Bajwa - Human Rights in India.

6. P.C.Sinha & - International Encyclopedia of Peace, Security K. Cheous (Ed) - Social Justice and Human Rights (Vols 1-7).

7. Devasia, V.V. - Human Rights and Victimology.

Course	: M.Sc. Chemistry	**Semester**	: 2nd semester
Subject	: Organic Chemistry Practical-I	**Batch**	: 2017 – 2018 Onwards
Subject code	: 17P2CHPR1	**Credit**	: 4

1. Identification of components in a two component mixture and preparation of their derivatives.

   Determination of b.p. / m.p. for components and m.p. for the derivatives.

2. Any Six preparation form the following

(i)   Preparation of o-benzyl benzoic acid

(ii)   p-Nitrobenzoic acid from p-nitrotoluene

(iii)   Anthroquinone from anthracene

(iv)   Benzhydrol from Benzophenone

(v)   m-Nitroaniline from m-dinitrobenzene

(vi)   1,2,3,4 - Tetrahydrocarbazole from cyclohexanone

(vii)   p-chlorotoluene form p-toluidine

(viii)   2,3 - Dimethylindole from phenyl hydrazine and 2 - butanone (boiling acetic acid)

(ix)   Methyl orange form sulphanilic acid

(x)   Diphenyl methane from benzyl chloride

Scheme of valuation

Examination	Marks
Qualitative organic Analysis	40
Preparation	20
Viva voce	10
Record	05
Total	**75**

Evaluation method for practical paper:

Distribution of Marks

Internal assessment	Marks
Two Tests	10
Results accuracy	10
Attendance/ Regularity	5
Total	**25**

References:
1. Arthur I. Vogel, "A Textbook of Practical Organic Chemistry", ELBS.
2. N.S. Gnanapragasam and B. Ramamoorthy, "Organic Chemistry Lab Manual" (2006),
   S. Visvanathan Printers & Publishers.

Course   : **M.Sc. Chemistry**   **Semester**   : **2nd semester**
Subject   : **Inorganic Chemistry Practical-I**   **Batch**   : **2017 – 2018 Onwards**
Subject code : **17P2CHPR2**   **Credit**   : **4**

1. Analyse systematically the given inorganic mixture salt containing four radicals.

2. Colorimetric Analysis (Instrument used -Photo Calorimeter) Estimation of Fe,Ni,Cu in the given solution by photo calorimeter.

Marks distribution:

Examination	Marks
Qualitative Inorganic Analysis	30
Colorimetric Analysis	20
Writing the procedure	10
Viva Voce	10
Record	05
Total	**75**

CONTINUOUS INTERNAL ASSESSMENT MARKS (CIA MARK)
MAX. MARKS = 25

Evaluation method for practical paper:

Distribution of Marks

Internal assessment	Marks
Two Tests	10
Results accuracy	10
Attendance/ Regularity	5
Total	**25**

Course	: **M.Sc. Chemistry**	**Semester**	: **2nd semester**	
Subject	: **Physical Chemistry Practical-I**	**Batch**	: **2017 – 2018 Onwards**	
Subject code	: **17P2CHPR3**	**Credit**	: **4**	

Experiments in Thermodynamics, colligative properties, phase rule, chemical equilibrium and chemical kinetics.
Typical examples are given and a list of experiments is also provided from which suitable experiments can be selected as convenient.

1. Heat of solution from Solubility measurements
2. Determination of Molecular weight
3. Determination of activity and activity coefficient
4. Construction of Phase diagram involving two / three component systems
5. Determination of partial molar quantities
6. Verification of Freundlich Adsorption isotherm
7. Reaction rate and evaluation of other kinetic parameters using polarimetry
8. Determination of Reaction rate and Rate constant using Analytical techniques: Conductometry and Dilatometry
9. Verification of Beer Lambert law.

Detailed list of Experiments for Physical Chemistry Practical I

Typical list of possible experiments is given.
Experiments of similar nature and other experiments may also be given.
Any 15 experiments have to be performed in a year.

1. Determine the temperature coefficient and energy activation of hydrolysis of ethyl acetate.
2. Study the kinetics of the reaction between acetone and iodine in acidic medium by half-life method and determine the order with respect to iodine and acetone.
3. Study the effect of solvent (DSMO-water, acetone-water system) on the rate of acid catalysed hydrolysis of acetal by dilatometry.
4. Study the Saponification of ethyl acetate by sodium hydroxide conductometrically and determine the order of the reaction.
5. Determine the order with respect to Silver (I) in the oxidation and rate constant and for uncatalysed reaction.
6. Study the inversion of cane sugar in the presence of acid using Polarimeter.
7. Determine the rate constant and order of the reaction between potassium persulphate and potassium iodide and determine the temperature coefficient and energy of activation of the reaction.
8. Study the effect of ionic strength on the rate constant for the saponification of an ester.
9. Study the salt effect on the reaction between acetone and iodine.
10. Study the kinetics of the decomposition of sodium thiosulphate by mineral acid (0.5M HCI).
11. Study the primary salt effect on the kinetics of ionic reactions and test the Bronsted relationship (iodide ion is oxidized by persulphate ion).
12. Study the kinetics of enzyme catalysed reactions (Activity of tyrosinase upon tyrosine spectrophotometrically).
13. Study the salt effect, the solvent effect on the rate law of alkaline hydrolysis of crystal violet.
14. Study the reduction of aqueous solution of ferric chloride by stannous chloride.
15. Determine the molecular weight of benzoic acid in benzene and find the degree of association.

16. Determine the activity coefficient of an electrolyte by freeing point depression method.
17. Study the phase diagram form-toluidine and glycerine system.
18. Construct the phase diagram for a simple binary system naphthalene - phenantherene and benzophenone-diphenyl amine.
19. Construct the boiling point composition diagram for a mixture having maximum boiling point and minimum boiling point.
20. Study the complex formation between copper sulphate and ammonia solution by partition method.
21. Study the simultaneous equilibria in benzoic acid - benzene - water system.
22. Determine the degree of hydrolysis and hydrolysis constant of aniline hydrochloride by partition method.
23. Determine the molecular weight of a polymer by viscosity method.
24. Determine the viscosities of mixtures of different compositions of liquids and find the composition of a given mixture.
25. Determine the partial molal volume of glycine / methanol and formic acid / sulphuric acid by graphical method and by determining the densities of the solutions of different compositions.
26. Study the temperature dependence of the solubility of a compound in two solvents having similar inter molecular interactions (benzoic acid in water and in DMSO water mixture) and calculate the partial molar heat of solution
27. Construct the phase diagram of the three component of partially immiscible liquid system (DMSO-water benzene; acetone-chloroform -water; chloroform-acetic acid-water)
28. Construct the phase diagram of a ternary aqueous system of glucose -potassium chloride and water
29. Study the surface tension - concentration relationship for solutions (Gibb's equation)
30. Study the absorption of acetic acid by charcoal (Freundlich isotherm).
31. Study the complex formation and find the formula of silver-ammonia complex by distribution method.
32. Determine the dissociation constant of picric acid using distribution law

Marks distribution:

Examination	Marks
Procedure	10
Manipulation	25
Result	25
Viva voce	10
Record	05
Total	**75**

CONTINUOUS INTERNAL ASSESSMENT MARKS (CIA MARK): MAX. MARKS = 25

Evaluation method for practical paper:

Distribution of Marks

Internal assessment	Marks
Two Tests	10
Results accuracy	10
Attendance/ Regularity	5
Total	**25**

Course	: M.Sc. Chemistry	**Semester**	: 3rd semester
Subject	: Organic Chemistry-III	**Batch**	: 2017 – 2018 Onwards
Subject code	: 17P3CH5	**Credit**	: 4

OBJECTIVES:

To understand the techniques involved in spectroscopy and to apply these techniques for the quantitative and structural analysis of organic compounds. To learn the importance of terpenoids, heterocyclic compounds and vitamins. To study the importance of aromaticity and photochemical reactions.

Unit:I Physical methods of structure determination

Principles and applications of ultraviolet and infrared spectroscopy in organic structure determination. Optical rotatory dispersion and its applications. Cotton effect, Axial haloketone rule and Octant rule. Woodward Fieser rule (only applications).

Unit:II Physical methods of structure determination

Nuclear magnetic resonance spectroscopy. Proton chemical shift, spin – spin coupling, coupling constants and applications to organic molecules – ^{13}C resonance spectroscopy and applications to simple organic molecules – Mass spectrometry – principles involved in it and applications to simple organic molecules. Problem solving approach (for molecules with a maximum of 10 carbon atoms).

Unit:III Aromaticity and methods of determining reaction mechanism

Aromaticity on benzenoid, heterocyclic and non-benzenoid compounds, Huckle's rule – aromatic systems with pi electron number other than six, non aromatic, anti aromatic and homoaromatic systems – systems with more than 10pi electrons – Annulenes up to 18 carbons. (Synthesis of all these compounds is not expected) and fullerenes.

Kinetic and Non kinetic methods of determining mechanism – Taft equation and Hammett equation, simple problems.

Unit:IV Photochemistry

Photochemical excitation, Fate of excited molecules Photosensitization, Jablonski diagram, study of Photochemistry of ketones (Norrish Type-I, Norrish Type – II), Photo reduction, Photocycloaddition, Paterno-Buchi reaction, Di-Pi methane rearrangement.

Pericyclic reaction – Classification, orbital symmetry – Woodward Hoffmann rule, analysis of electrocyclic, cycloaddition and sigmatropic reactions, Interconversion of hexatriene to cyclohexadiene.FMO method for cycloaddition and electrocyclic reactions.Correlation diagram for butadiene – cyclobutene system only. Stucture of bullvalene, a fluxional molecule - Claisen and Cope rearrangement

Unit:V Heterocyclic Compounds

Flavones, isoflavones and anthocyanin, pyrimidines (Cytocine and Uracil only) and purines (adenine, guanine only) Synthesis of parent and simple alkyl or aryl substituted derivatives are expected. Synthesis of vitamin – A_1 (Reformatsky and Wittig reaction methods only).

Recommended Books

1. Application of absorption spectroscopy of organic compounds by J. Dyer, Prentice and Hall of India, Pvt., New Delhi.

2. Spectrometric identification of organic compounds by R.M. Silverstein, G.d. Bassler and Monsu. John Wiley and Sons, New York.

3. Introduction to the spectroscopic methods for the identification organic compounds - 2 volumes, Schiemann Pergamman Press.

4. Organic Chemistry, Vol. II, I.L. Finar, 5th edition ELBS publication.

5. Spectroscopy of Organic compounds by P.S. Kalsi, Wiley Eastern Ltd., Chennai.

6. Advanced organic chemistry III Edition by J. March.

7. Advanced organic Chemistry by Francis A. Carey and Richard J. Sundberg, 3rd Edition (1990).

8. Physical organic chemistry by Neil S. Issac, ELBS publication 1987.

9. Organic reaction mechanism, Macmillan India, 1999.

10. Spectroscopy W. Kemp, Macmillan Ltd.,

11. Structural identification of organic compounds Y.R. Sharma, S. Chand & Co.

12. Chemistry of organic Natural Products by Dr.O.P. Agarwal, Goel Publishing House, Meerut.

13. Molecular Reaction and Photochemistry by Charles H. Depuy and Orville, L. Champman, Prentice Hall of India Pvt., Ltd., New Delhi.

**MODEL QUESTION PAPER-
ORGANIC CHEMISTRY-1II
(17P3CH5)**

Duration : 3 Hours   **Maximum : 75 Marks**

SECTION – A (5x6=30 Marks)

Answer all the questions

1.a) What is meant by n- π^* , π- π^* and excitation? Arrange them in the order of decreasing energy.

OR

  b) How will you differentiate the following pairs of compounds by IR spectroscopy

        a) O – Hydroxy acetophenone and P – Hydroxy acetophenone

        b) Phenyl ethyl ketone and benzyl methyl ketone

        c) Acetone and 2 – propanol

        d) Glycine and Zwitter ionic glycine

2. a) Explain McLafferty rearrangement with a suitable example.

OR

  b) How will you proceed to find out whether two ^{1}H nmr signals separated by 10Hz   arecomponents of a double or two separate singlets?

3. a) Discuss the aromaticity of [18 annulenes]

OR

  b) Explain aromatic, antiaromatic, non aromatic and partly aromatic with suitable examples.

4. a) Draw the jablonski diagram and explain the various photophysical processes.

OR

  b) $^2\pi_s$ + $^4\pi_s$ cycloaddition takes place readily under thermal condition but forbidden under photochemical condition. Explain using FMO method

5. a) Describe the Baker Venkatraman synthesis of flavones starting from ortho hydroxy acetophenone.

OR

  b) Write a note on flavones .

SECTION – B (3X15=45 Marks)

6.   a) Explain the term ORD, CD and cotton curve. Draw the positive and negative cotton curves

     b) Discuss the Octant rule and its application in determining the conformation and configuration of molecules.

7.   An Organic compound of the molecular weight 94 revealing an (M+2) peak at m/z 96 which almost one third as intense as its M$^+$ peak, exhibits a broad beak in its IR spectrum around 3100 cm^{-1} . the ^{1}H nmr spectru has just two absorptions, one at 4.1 del and other at 10.9 del. Its ^{13}C nmr spectrum reveals a triplet 46.7 del and a singlet at 173.2del. Deduce the structure.

8.   a) How would u convert cholesterol in to testesterone .

     b) How was the nature and position of side chain in cholesterol is established.

9.   a) What is Photosensitizer? Give two examples.

     b) What are pericyclic reactions? How are they classified?

10.   a) Outline the synthesis of Vitamin - A

     b) Give the synthesis of uracil and guanine.

Course	**: M.Sc. Chemistry**	**Semester**	**: 3rd semester**
Subject	**: Inorganic Chemistry-III**	**Batch**	**: 2017 – 2018 Onwards**
Subject code	**: 17P3CH6**	**Credit**	**: 4**

Objective

To study about structure and defects of solids and basic concept of crystallography. To learn about organaometallic chemistry

UNIT-I

Electronic structure of solids: Bonding in solids: Ionic, covalent, metallic and molecular solids. Free electron theory, Fermi sphere, Fermi-Dirac statistics, Ohm's law, limitations of the free electron theory Electrons in a weak periodic potential (Independent electron model), energy levels in extended, repeat and reduced zone schemes

Electrical and Magnetic Properties of Solids

Semiconductors: p and n-types, Hall effect, Junctions and their applications- metal-metal, metal-semiconductor, semiconductor-semiconductor types and transistors.

Insulators- dielectric properties, piezo and inverse piezoelectric effects, ferroelectricity, ferroelectric transitions in $BaTiO_3$, ionic conductivity applications of band theory to TiO and NiO: Limitations of the Independent electron model, modeling electron correlation.

UNIT-II

Defects in Solids

Point defects, Line defects and Plane defects, Stacking faults and grain boundaries

Superconductivity

Superconductivity, Meisner effect, Type I and type II superconductors, Features of superconductors, Theory of low temperature superconductivity, Junctions using superconductors and high temperature superconductor application.

Phase Transition in Solids

Definitions, Classification of phase transitions, First and second order phase transitions: order-disorder transitions and spinodal decomposition

Geometric Crystallography

Symmetry elements, Bravais lattices, Screw axes, point groups, and space groups and nomenclature. Law of Interfacial angle.

UNIT-III

Diffraction theory and Single crystal X-ray diffraction

X-rays, Bragg's law, diffraction pattern of a primitive cubic lattice, space group, Scaterring factor and structure factor, intensities from atomic positions for BCC and FCC lattices

Experimental Methods

Rotation, Oscillation, Weissenberg methods. Debye-Scherrer method (Powder method), Determination of lattice parameters from these methods.

UNIT:IV

Organometallic Chemistry: Carbon donars: Alkyls and aryls; metalation, Bonding in carbonyls and nitrosyls. Synthesis and reactivity of chain and cyclic donors; Olefin, acetylene and allyl systems. Synthesis, Structure and bonding of metallocenes.

Reactions: Association, substitution, addition and elimination reaction; ligand protonation.

UNIT:V

Organometallic Chemistry: Reactions: Electrophilic and nucleophilic attack on ligands. Carbonylation and decarbonylation. Oxidative addition reaction. Fluxional molecules.

Catalysis: Hydrogenation of olefin (Wilkinson's catalyst), Hydroformylation of olefins using cobalt and rhodium catalysts (Oxo process). Oxidation of olefins to aldehyde and ketones (Wacker process), polymerization (Zeigler-Natta catalyst). Cyclo-oligomerisation of acetylene using nickel catalyst (Reppe's catalyst). Polymer bound catalysts and metal carbene complexed.

SUGGESTED BOOKS

1.   Introduction to Solids, L. V. Azaroff, McGraw Hill Book Co., New York, 1960.
2.   Solid State Physics, N. W. Ashcroft and N. D. Mermin, Holt Saunders International Ltd., New York (1976).
3.   Physical Chemistry, G. M. Barrow, McGraw Hill (2nd ISE) (1966).
4.   An Introduction to X-ray Crystallography, M. M. Woolfson, Cambridge University Press-Vikas Publishing House, New Delhi (1980).
5.   Principles of the Solid State, H. V. Kheer, Wiley Eastern Ltd., New Delhi (1993).
6.   Dynamics of Atoms in Crystals, W. Cochran, Edward Arnold, London, 1973. (pages 24-37)
7.   Vibrational Spectroscopy of Solids, P.M.A. Sherwood, University Press, Cambridge, 1972. (pages: 1-45)
8.   Phase Transitions, C.N.R. Rao and K.J. Rao, Cambridge University Press
9.   X-ray Structure determination: A practical guide, George H Stout and Lyle H Jenson, Macmillan Publishing Co.Inc and Collier Macmillan Publishers Inorganic and Analytical Chemistry)
10.   Principle and Application of Organotransition Metal Chemistry, Colman and Hegsdus, University Science Books.
11.   The Organometallic Chemistry of the Transition Metal, R.H. Crabtree, John Willey.
12.   Organometallic Chemistry, R.C.Methrotra and A.Singh,New Age International.
13.   Solid State Chemistry and its Applications, 2nd Edition, Student Edition Anthony R. West, 2014.

**MODEL QUESTION PAPER-
INORGANIC CHEMISTRY-1II
(17P3CH6)**

Duration : 3 Hours | **Maximum : 75 Marks**

Section A (5 x 6 = 30 marks)

Any all questions

1. (a) Explain Fermi-Dirac statistics.
        Or
    (b) Explain ferroelectric transitions in $BaTiO_3$

2. (a) Explain Bravais lattics and Screw axes
        Or
    (b) Discuss point defects and line defects

3. (a) Discuss diffraction pattern of a primitive cubic lattice
        Or
    (b). Explain Bragg's law and scaterring factor

4. (a) Discuss reactivity of cyclic donors
        Or
    (b) Explain carbon donars and ligand protonation

5. (a) Discuss Wilkinson's catalyst
        Or
    (b) Explain Zeigler-Natta catalyst.

Section B (3 x 15 = 45 marks)

Any three questions

6. Describe transistors, inverse piezoelectric effect and ferroelectricity

7. Describe Stacking faults, grain boundaries and spinodal decomposition

8. Describe Weissenber and Debye-Scherrer methods

9. Describe synthesis, structure and bonding of ferrocene

10. Describe fluxional molecules and Oxo process.

Course	: M.Sc. Chemistry	**Semester**	: 3rd semester
Subject	: Physical Chemistry-III	**Batch**	: 2017 – 2018 Onwards
Subject code	: 17P3CH7	**Credit**	: 4

OBJECTIVES:

To study the electrochemical kinetics, over potential, corrosions and fuel cells. To know the solid state and its properties. To Study the principles and applications of spectroscopy. To study statistical thermodynamics,

UNIT-1: ELECTROCHEMISTRY- III

Mechanism of electrode reactions - polarization and over potential - the Butler-Volmer equation for one step and multistep electron transfer reactions - significance of electron exchange current density and symmetry factors - transfer coefficient and its significance - mechanism of the hydrogen and oxygen evolution reactions.

Corrosion and passivation of metals - Pourbaix diagram - Evan's diagram - fuel cells - electrodeposition - principle and applications.

UNIT-II: SOLID STATE

Classification of solids - Imperfection in solids - point, line and plane defect - Electrons and holes - Non-stoichiometry - Imperfection and physical properties of solids (brief study).

Electrical properties - electrical conductivity - Hall effect - dielectric properties - piezo electricity, Ferro electricity and conductivity;

Optical properties - Photo conductivity -luminescence - color center - lasers - refraction - birefringence;

Magnetic properties - diamagnetism - paramagnetism - ferro - antiferro and ferrimagnetisms. Calculation of magnetic moments. Mechanical and thermal properties.

UNIT-III: SPECTROSCOPY - I

Microwave spectroscopy – Rotational spectroscopy of rigid rotator - non rigid rotator - diatomic and polyatomic molecules.

Vibrational spectroscopy - Harmonic oscillator - anharmonicity - vibrational spectra of polyatomic molecules - vibrational frequencies - group frequencies - vibrational coupling- overtones - Fermi resonance.

Raman Spectroscopy- Raman effect, Stoke's and Anti-stoke's lines, rotational and vibrational Raman spectra.

Electronic spectroscopy - Progressions and sequences, selection rules, Franck - Condon principle, types of electronic transitions - solvent effects.

UNIT-IV: SPECTROSCOPY- II

Resonance spectroscopy - Zeeman effect - equation of motion of spin in magnetic fields - chemical shift - spin-spin coupling - NMR of simple AX and AMX type molecules - calculation of coupling constants - ^{13}C, ^{19}F, ^{31}P NMR spectra - applications - a brief discussion of Fourier Transformation Resonance Spectroscopy.

UNIT-V: STATISTICAL THERMODYNAMICS- I

Objectives of statistical thermodynamics - concept of thermodynamic and mathematical probabilities - permutations and combinations, distribution of distinguishable and non-distinguishable particles. Stirling approximation, Maxwell - Boltzmann distribution law - Fermi - Dirac and Bose - Einstein statistics - comparison with Maxwell -Boltzmann distribution law and their applications - radiation law - electron gas in metals. Partition function - evolution of translational, vibrational and rotational partition functions for mono and diatomic ideal gases.

Text Books

S.Glasstone, Introduction to Electrochemistry, Affiliated East West Press, New Delhi (1960).

D.R. Crow, Principles and Applications to Electrochemistry, Chapman and Hall (1991).

S. Glasstone, Introduction to Electrochemistry, Affiliated East West Press, New Delhi (1960).

P.H.Rieger, Electrochemistry, Chapman and Hall, New York (1994).

R.Crow, Principles and Applications to Electrochemistry, Chapman and Hall (1991).

Lesley E.Smart, Elaine A.Moore, Solid State Chemistry - An Introduction

Charles Kittel - Introduction to Solid State Physics

Anthony R. West - Solid State Chemistry and its Applications

C.N. Banwell and E.M. McCash, Fundamentals of Molecular spectroscopy, IV - Edition, Tata McGraw Hill (2005).

N. Sathyanarayana, Vibrational Spectroscopy, New Age International Publishers (2004).

Caringtion and Ad. Mclachlan, Introduction to Magnetic Resonance, Harper and Row, New York (1967).

M. C.Gupta, Statistical thermodynamics, Wiley Easter, New Delhi (1990).

R.Hasee, Thermodynamics Of Irreversible Process, Addition Wesley, Reading, Mass (1969).

Suggested References

J.O.M. Bokris and A. K. N. Reddy, Electrochemistry, Vol. 1 and 2, Plenum, New York (1977).

P. Dalahay, Electrode Kinetics and Structure of Double Layer, Inter Science, New York (1965).

J.Robbins, Ions in Solution-An Introduction to Electrochemistry, Clarendon Press, Oxford (1993).

Course	: M.Sc. Chemistry	Semester	: 3rd semester
Subject	: Advanced Chemistry	Batch	: 2017 – 2018 Onwards
Subject code	: 17P3CH8	Credit	: 4

Broad objectives

To enable the students
❖ To develop the ability for applying the principles of chemistry.
❖ To familiarize the emerging areas of chemistry and their applications in various spheres
❖ To make the students eco-friendly by creating a sense of environmental awareness in
❖ them.
❖ To make the students aware of the applications of chemistry in day-to-day life.
❖ To appreciate the achievements in chemistry and to know the role of chemistry in nature
❖ and in society.

UNIT-I PRINCIPLE AND CONCEPT OF GREEN CHEMISTRY

Introduction- Concept and principles- Development of green chemistry-Need for green chemistry. The Twelve principles of green chemistry. Solvent free reactions-thermal and photochemical. Catalytic approach (Zeolites & Clay), and Biocatalytic reactions in green chemistry.

UNIT-II MICROWAVE TECHNOLOGY ON CHEMISTRY

Microwave technology on chemistry-Microwave heating, Microwave assisted reactions-electrochemical synthesis and examples .Microwave assisted synthesis-Theory, advantages of MW technique reactions. Introduction to life cyclic assessment (LCA) - Carbon foot printing-Green process matrices- Eco labels – Integrated pollution-Prevention and control.

UNIT –III INTRODUCTION TO RETROSYNTHETIC ANALYSIS

Retro synthesis using level I chemistry. Disconnection next to heteroatoms, next to carbonyl group. Introduction to disconnection approach.- Basic principles ; Synthesis of aromatic compounds. The order of events. One group C-X disconnections and chemoselectivity. Two group C-X disconnections. Reversal of polarity, cyclisation reaction. Protecting groups, Amine synthesis. One group C-C disconnections-I ; Alcohol. Introduction to carboyl condensation.

UNIT-IV DRUG DESIGN

Development of new drugs – Procedure followed in drug design. Concepts of prodrugs and soft drugs. Theories of drug activity - Quantitative structure activity relationship (QSAR). Drug toxicity – Thalidomide tragedy (a brief study) - United state pharmacopoeia, Indian pharmacopoeia and British pharmacopoeia (a brief study). Routes of drug administration – Effective use of drugs – Over dosage – Prescription and non-prescription drugs – Drug abuse.

UNIT-V NANOTECHNOLOGY

Introduction of Molecular nanotechnology, Nanomaterials – nanocrystals, nanowires, nanotubes, nanocomposites, fullerene, bucky balls. Carbon nanotubes – preparation, properties, characteristics and applications. Nanoprobes, Nanocomposites (polymers and cement), Flame retardant materials. Medical applications of Nanomaterials.

REFERENCE BOOKS

1. Advanced organic chemistry – Part-B. Reactions and synthesis. Francis A. Carey and Richard J. Sundberg, Fourth edition.

2. Organic chemistry. J.Clayden,N.Greevs, S.Warren and P.Wothers.

3. A disconnection approach – Stuart warren, John Wiley and sons.

4. Green chemistry, S.Delvin, IVY publishing house, 2006.

5. The Organic chemistry of drug design and drug action, Silverman,R.

6. The Handbook of Microwave Technology , T.Koryu Ishii.

7. Green chemistry, R.Sanghi and M.M.Srivastava, Narosa, 2003.

8. Drug Design Methodology, Concepts and mode of actions. Klebe, Gerhard.

9. Handbook of Microwave Technology; Applications edited by Thomas Koryu Ishii.

10. Carbon nanotubes: Multifunctional materials, Prakash R.Somani and M.Umenos.

Course	: M.Sc. Chemistry	**Semester**	: 3rd semester
Subject	: Scientific Research Methodology	**Batch**	: 2017 – 2018 Onwards
Subject code	: 17P3ECH	**Credit**	: 2

Objectives

To study about the importance of research, literature survey, error analysis, statistical treatment. To study about the conventions of writing thesis.

UNIT-I: INTRODUCTION

Nature and importance of research - aims, objective, principles and problems - selection of research problem - survey of scientific literature - primary and secondary sources – citation index for scientific papers and journals - patents.

UNIT-II: CONDUCT OF RESEARCH WORK

Physical properties useful in analysis and methods of separation prior to analysis – Isolation techniques - extraction - Soxhlet extraction, crystallization, sublimation - methods for vacuum sublimation and distillation under reduced pressure. Chemistry of working with hazardous materials - acid / water sensitive, corrosive, toxic, explosive and radioactive materials.

UNIT-III: EVALUATION OF ANALYTICAL DATA

Precision and accuracy - Reliability - determinate and random errors - distribution of random errors - normal distribution curve.

UNIT-IV: STATISTICAL TREATMENT OF ANALYTICAL DATA

Statistical treatment of finite samples - the students test and F test - Criteria for rejection of an observation - the Q test, significant figures and computation rules - data plotting - least square analysis.

UNIT-V: THESIS AND ASSIGNMENT WRITING

Conventions of writing - the general format - page and chapter format - use of quotations and footnotes - preparation of tables and figures - referencing - appendices - Revising editing and evaluating the final product - proof reading - Meanings and examples of commonly used abbreviations.

References:

Douglas A. Skoog and Donald, M. West, Fundamental of analytical chemistry, Halt Saundersons International Edition.

J. Anderson, H.M. Durston and M.Poole, Thesis and assignment writing - Wiley Eastern Ltd., (1970).

J. March, Advanced organic chemistry - reactions, Mechanism & Structure. McGraw Hill Student Edition.

Vogel's Textbook of quantitative chemical analysis, ELBS edition.

Duration : 3 Hours   **Maximum : 75 Marks**

Section A (5 x6 = 30)

Answer ALL questions

1.a) Explain the selection of a research problem considering an example of " Metal complexes"

Or

1b) Discuss about the citation index for scientific research papers.

2.a) Describe the methods of vacuum sublimation and distillation under reduced pressure.

Or

2.b) Write a note fractional distillation technique with suitable example.

3.a) Explain about the various types of errors met during chemical analysis.

Or

3.b) List out the safety measures adopted during explosive and radioactive reactions.

4.a) Explainwith suitable example on significance figure ?

Or

4.b) Write a note on 'Q' test.

5.a) Write a brief note on the use of quotations and foot notes.

Or

5.b) Discuss the meaning and examples of commonly used abbreviations.

Section B-(3x 15 =45)

Answer and THREE questions

6. Explain the following i) Primary and secondary sources   ii) Survey of scientific

   literature

7. Discuss the terms with pictorial expression on i) Soxhlet extraction ii) Crystallisation

8. Discuss about the random and determinate errors.

9. Draw and explain about the various computation rules with example.

10. Describe the general format of the thesis and assignment and referencing and

    appendices.

Course	: M.Sc. Chemistry	**Semester**	: 4th semester
Subject	: Organic Chemistry-IV	**Batch**	: 2017 – 2018 Onwards
Subject code	: 17P4CH9	**Credit**	: 5

OBJECTIVES:

To understand the concepts behind synthesis of any type of organic compound. To learn the importance of the Bio-Organic molecules and free radicals.

Unit:I Bio – Organic Chemistry

Nucleic acids - structure and hydrolysis products - Nucleosides, Nucleotides DNA -primary structure-secondary structure – Watson - Crick double helix structure.

RNA – structure – types of RNA and their function, Comparison of RNA and DNA – Genes, Genetic code, Codon, some examples of Codon, AMP, ADP, ATP.

Definition and explanation of the following terms: Replication, transcription, translation, Biosynthesis of Protein.

Unit:II Protein Synthesis

Peptides and their synthesis (Synthesis of tripeptide using the aminoacids Glycine, Alanine, Lysine, Cysteine, Glutamic acid, Arginine only). Merrifield synthesis, Determination of Tertiary structure of proteins.

Unit:III Alkaloids and Synthesis of selected molecules

Total synthesis of quinine, morphine, reserpine and cocaine. Biosynthesis of cholesterol and Bile acids.

Synthesis of the following target molecules longifolene, cubane, 5-hexenoic acid, trans-9-methyl-1-decalone, Bicyclo(4.1.0) heptan-2-one and α- onocerin.

Unit:IV Modern synthetic methodology

Synthesis of simple organic molecules using standard reactions like Acetylation and Alkylation of enamines and active methylene compounds, Grignard reagents, Phosphorous and sulphur ylides, Robinson annulations, Diels-Alder reaction, protection and deprotection of functional groups (R-OH, R-CHO, R-CO-R, R-NH_2, R-COOH). Uses of the following reagents: DCC,trimethylsilyliodide, 1,2-dithiane(umpolung), Trimethylsilylchloride, Reduction: Selectivity in reduction of 4-t-butylcyclohexanone using selecterides.

Unit:V Free radicals

Long lived and short lived free radicals, methods of generation of free radicals. Addition of free radicals to olefinic double bonds. Aromatic radical substitution: decomposition of diazo compounds, phenol – phenol coupling, Sandmeyer reactions, Gomberg – Bauchmann reaction, Ullmann reaction, mechanism of Hunsdiecker reaction. Detection of free radicals by ESR.

Recommended Books

1. Guide book to Organic synthesis by Ramond K. Mackie and David M. Smith, ELBS Publication.

2. Chemistry of alkaloids by Pelletier.

3. Introduction to Alkaloids by G.A. Swan

4. Organic Chemistry V Edition, 1986, VolII by I.L. Finar, ELBS Publication

5. Outlines of Biochemistry V Edition by Eric E. Conn, Paul. R. Stumpf, George Bruening and Roy H. Dole, John Wiley and Sons.

6. Principles of Biochemistry General aspects by L. Smith, Robert L. Hill I. Robert Lehman, Robert J. Let Rowitz, Philip Handlar and Abrahim white. McGraw Hill Int. (7th Edition)

7. Biochemistry by Lubert Stryer, WH. Freeman and Co., New York

8. Chemistry of organic natural products by Agarwal, Geol Publishing House.

9. Organic synthesis by R.E. Ireland, Prentice Hall of India, Geol Publishing House.

10. Principles of Organic synthesis by R.O.C. Norman, Champan and Hall, NY, 1980.

11. Advanced Organic Chemistry by Francis. A. Carey Richard J. Sundberg, 3rd Edition, Plenum, Press, New York, 1990.

12. Advanced Organic Chemistry by Jerry March, IV edition Wiley Eastern Ltd., New Delhi.

13. Organic Chemistry, 6th Edition, 1992. RT.Morrison, R.S. Boy, Prentice Hall of India Pvt. Ltd., New Delhi.

14. Organic synthesis by Michael Smith

15. Organic Chemistry by House.

16. Micheal B. Smith, Organic Syntheis, McGraw Hill, International Editor, 1994.

17. Stuart Warren, Work book for organic synthesis, The Disconnection Approach John Wiley & Sons (Asia) Pvt. Ltd.,

18. W. Carruther, Jain Coldham, Modern Methods of organic synthesis, 4th Edition.

**MODEL QUESTION PAPER-
ORGANIC CHEMISTRY-1V
(17P4CH9)**

Duration : 3 Hours   **Maximum : 75 Marks**

SECTION – A (5x6=30 Marks)

Answer all the questions

1.   a) Explain briefly "Repeated bonds and linking monomer units" in a polynucleotide. Indicate the significance of the linkages.
           OR
      b) What is the difference between ADP, AMP and ATP. Draw the structures, indicate the numbers and explain the linkages. Classify whether they are nucleotides, nucleosides or nucleic acids. Justify your answer.

2.   a) With a suitable illustration, outline the synthesis of a tripeptide explaining the step involved.
           OR
      b) How is the tertiary structure of protein determined?

3.   a) Give the total synthesis of Onocerin.
           OR
      b) Explaining the total synthetic statergies involved in the synthesis of cubane.

4.   a) Explain Robinson annulations reaction with an example.
           OR
      b) Explain Diels – Alder reaction. Explain it with respect to stereochemical aspects.

5.   a) Give a short total synthetic sequence of longifolene.
           OR
      b) Write mechanism of Hundsdiecker reaction. Demonstrate its synthetic use.

SECTION – B (3X15=45 Marks)

6.   a) Define the following:
              a) Gene b) Genetic code c) Codon.
      b) Write a note on Watson and Crick model of DNA
      c)   How does the energy conversion take place from ATP to ADP? How ADP is converted in to ATP?

7.   a) Write a protein synthesis route with linkage code G-A-L-C.
      b) Explain in brief about Merrifield field synthesis.

8.   a) Write a total synthesis of Cholestrol
      b) Synthesis of Longifolene.

9.   a) How do the following functional groups are protected with selective reagents
              a) Primary alcohol b) Ketone c) Tertiary amine
      b) Starting from allyl alcohol how will you prepare 5-hexenoic acid. Interpret all the reactions.

10.   a) How do free radicals is detected by EPR spectroscopy? Explain with an example.
      b) Discuss the mechanism of Pschorr and Goberg – Bauchmann reactions.

Course	: **M.Sc. Chemistry**	**Semester**	: **4th semester**
Subject	: **Inorganic Chemistry-IV**	**Batch**	: **2017 – 2018 Onwards**
Subject code	: **17P4CH10**	**Credit**	: **5**

Objective

To study about Nano materials and amorphous materials. To learn about inorganic chemistry spectroscopy, electron transfer reaction and bio-inorganic chemistry

UNIT-I

Nanomaterials: Classification types of carbon nano tubes synthesis, functionalization characterization and applications.

Preparation of nanoscale materials: Precipitation, mechanical milling, colloidal routes, self assembly: chemical vapour deposition, sputtering, evaporation.

Synthesis, characterization and applications of nanoparticles, nano wires and nanotubes.

Elemental nanoparticles: Pure, Gold, Silicon, Silver ,Cobalt, Oxide nanoparticles: Silica,

Zinc oxide, Iron oxide, Alumina.

UNIT-II

Amorphous Materials: Crystalline versus amorphous solids, glass formation, Preparation techniques- melt spinning, sputtering, ion implantation, Structural models of amorphous materials, Properties of metglasses - mechanical, electronic and magnetic properties.

Liquid Crystals: Mesomorphic behaviour, classification, examples - thermotropic and lyotropic liquid crystals Calamitic, nematic phase A, B, smectic phase, chiral nematic phase and optical properties of liquid crystals. Applications with special reference to display systems

UNIT: III

INORGANIC SPECTROSCOPY: Applications of NMR-^{19}F, ^{31}P, ^{11}B NMR spectra of simple compounds, Mossbauer spectroscopy: Basic principles, isomer shift, quadrupole splitting and magnetic hyperfine interactions, application to the study of bonding and structures of Fe^{2+} and Fe^{3+} compounds, Sn^{2+} and Sn^{4+} compounds - NQR (Fe, Si, Al, Te and Se compounds)

ESR: Introduction - Zeeman equation-value-Nuclear hyperfine splitting-presentation of the spectrum, simple carbon centred free radicals-anisotropy-g value and hyperfine splitting constant-Mcconel's equation-Kramer's theorem. ESR of transition metal complexes of copper, manganese and vanadyl complexes.

Photo electron spectroscopy (UV and X-ray) photo electron spectra – Koop man's theorem - fine structures in PES-Chemical shift and correlation with electronic changes.

UNIT: IV

Reactions mechanisms-substitution reaction in octahedral and square planar complexes, Marcus theory, trans effect and its influence, water exchange, anation and base hydrolysis, stereochemistry, inner and outer sphere electron transfer mechanism.

UNIT: V

Role of metal ions in biological processes, structure and properties of metalloproteins in electron transport processes, cytochromes, ferrodoxins and iron sulphur proteins, ion transport across membranes, Biological nitrogen fixation, photo synthesis – I, photo synthesis – II, Oxygen uptake proteins.

SUGGESTED BOOKS

1.   Nanostructured Materials: Processing, Properites and Applications, ed. C.C.Koch, Willaim Andrew Publishing, New York, 2002.

2.   Nanomaterials: Synthesis, properties and applications, Ed. By A.S.Edelstein and R.C.

        Cammarata, Inst. of Physics, UK 1966.

3.   Science of Engineering Materials, C.M. Srivastava and C. Srinivasan, Wiley-Eastern Ltd. (1991).

4.   Material Science and Engineering. W.D. Callister , John Wiley and Sons Inc. (1985).

5.   Nanotubes and Nano wires CNR Rao, & A Govindaraj, RSC, London 2005.

6.   NANO: The essentials T. Pradeep, McGraw-Hill, 2008.

7.   Liquid Crystals, Nature's delicate phase of matter, Peter J Collings, Princeton University Press, 2002

8.   Nanochemistry, A chemical approach to Nanomaterials, Geoffrey A Ozin and Andre C Arsenault, RSC, 2006.

9.   Practical NMR Spectroscopy,M. L. Martin, J.J.Delpuch and G.J.Martin, Hayden.

10.   Modern Spectroscopy, J.M.Hollas, John Wiley

11.   Physical Methods in Inorganic Chemistry, R.S.Drago, Affiliated East West Press Pvt. Ltd., New Delhi (1965)

12.   Introduction to Molecular Spectroscopy, G.M.Barrow, McGraw Hill

13.   Mossbauer Spectroscopy, N.N.Greenwood, T.C. Gibbs, Chapman and Hall Ltd.(1971)

14.   Introduction to photoelectron Spectroscopy, P.K.Ghosh, John wiley

15.   Principle and Application of Organotransition Metal Chemistry, Colman and Hegsdus, University Science Books.

16.   The Organometallic Chemistry of the Transition Metal, R.H. Crabtree, John willey.

17.   Organometallic Chemistry, R.C.Methrotra and A.Singh,New Age International.

18.   Bioinorganic chemistry, Stereri Lippard, University Science Books: Mill Valley, CA (1994).

Duration : 3 Hours   **Maximum : 75 Marks**

Section A (5 x 6 = 30 marks)

Any All questions

1.   (a) How will prepare nanoscale materials by mechanical milling and colloidal routes
                   Or
        (b) Explain classification types of cabon nano tubes sunthesis.

2.   (a) Explain ion implantation
                Or
        (b) Discuss optical properties of liquid crystals

3.   (a) Explain Koop man's theorem
                   Or
        (b) Discuss Mcconel's and Zeeman equations

4.   (a) Explain Marcus theory
                   Or
        (b) Discuss Trans effect

5.   (a) Explain nitrogen fixation
                   Or
        (b) Explain ferrodoxins

Section B (3 x 15 = 45 marks)

Any three questions

6.   Describe chemical vapour deposition and sputtering method.

7.   Describe nematic phase, smectic phase and chiral nematic phase of liquid crystals.

8.   Explain ESR spectra of copper, manganese and vanadyl complexes.

9.   Describe inner and outer sphere electron transfer mechanism

10.   Describe iron sulphur proteins and ion transport across membranes.

Course	: **M.Sc. Chemistry**	**Semester**	: **4th semester**
Subject	: **Physical Chemistry-IV**	**Batch**	: **2017 – 2018 Onwards**
Subject code	: **17P4CH11**	**Credit**	: **5**

OBJECTIVE

To study the principles of photochemical reactions. To study the Experimental methods and kinetics studies of photochemical reactions. Study of electrode - electrolytic interface. To study the fundamental principles of quantum chemistry and its application to chemical bonding. Schrödinger wave equation and its applications. To study statistical thermodynamics, quantum statistics and irreversible thermodynamics.

UNIT- I: PHOTOCHEMISTRY - I

Absorption and emission of radiation - Franck - Condon Principle - decay of electronically excited states - Jablonski diagram - radiative and non-radiative processes - fluorescence and phosphorescence - spin forbidden radiative transition - Internal conversion and intersystem crossing - energy transfer process - kinetics of unimolecular and bimolecular photophysical processes - excimers and exciplexes - static and dynamic quenching - Stern-Volmer analysis.

UNIT- II: PHOTOCHEMISTRY - II

Experimental methods - quantum yield and life time measurements - steady state principle - quantum yield and chemical actinometry. Kinetics of photochemical reactions: hydrogen and halogen reactions, Brief study about photoredox, photosubstitution, photoisomerization and photosensitized reactions - photovoltaic and photogalvanic cells, photo electrochemical cells, photo-assisted electrolysis of water, aspects of solar energy conversion.

UNIT- III: QUANTUM CHEMISTRY - I

Failure of classical mechanics - Compton effect - wave particle duality - uncertainty principle - waves - wave equation for electrons - quantum mechanical postulates - The concept of operators - Hermitian property. Schrodinger wave equation - application of Schrodinger's equation - the particle in a box (one, and three dimensional cases) - particle in a ring, solution to rigid rotor and harmonic oscillator. Schrodinger equation for hydrogen atom (no derivation is required) and the solutions.

UNIT- IV: QUANTUM CHEMISTRY - II

Approximation methods - Perturbation and Variation methods - application to hydrogen molecule and helium atoms. Born - Oppenheimer approximation - valence bond theory for hydrogen molecule - LCAO - MO theory for diatomic molecules. Concept of hybridization - Huckel theory for conjugated molecules (Ethylene, butadiene and benzene).

UNIT- V: STATISTICAL THERMODYNAMICS - II

Thermodynamic functions in terms of partition functions - application of partition function to heat capacity of ideal gases - nuclear partition function - contribution to heat capacity of ortho and para hydrogen. Heat capacity of solids - Einstein and Debye models, Negative Kelvin temperature. Entropy of monoatomic gases - Sackur-Tetrode equation.

Irreversible thermodynamics - forces and fluxes - linear force - flux relation - phenomenological equations.

TEXT BOOKS

N.J.Turro, Modern Molecular Photochemistry, Benjamin, Cumming, Menlo Park, California (1978).

K.K.Rohatgi, Mukherjee, Fundamentals of Photochemistry, Wiley Eastern Ltd., (1978).

R.K. Prasad, Quantum Chemistry, Wiley Eastern, New Delhi (1992).

D.A. Mcquarrie, Quantum Chemistry, University Science Books, Mil Valley, California (1983). Quantum Chemistry, Allyn and Bacon, Boston (1983).

R.Anantharaman, Fundamentals of Quantum Chemistry, Mac Millan India Limited (2001).

M.W. Hanna, Quantum Mechanics in Chemistry, W.A. Benjamin Inc. London (1965).

M.C.Gupta, Statistical thermodynamics, Wiley Easter, New Delhi (1990).

R.Hasee, Thermodynamics Of Irreversible Process, Addition Wesley, Reading, Mass (1969).

L.K. Nash, Elements of Chemical Thermodynamics, Addision Wesley (1962).

G.M. Barrow, Physical Chemistry, McGraw Hill (1988).

R.L. De Koch and H.B. Gray, Chemical Structure and Bonding, Benjamin- Cumming, Menlo Park, California.

S.Glasstone, Text Book of Physical Chemistry.

Suggested References

A.K. Chandra, Introductory Quantum Chemistry, Tata Mc Graw Hill.

D.A. Mc Quarrie, Quantum Chemistry, University Science Books, Mill Valley, California (1983).

P.W. Atkins, Molecular Quantum Mechanics, Oxford University Press, Oxford (1983).

J.G.Clavert and J.N.Pitts, Photochemistry, Wiley, London (1966).

R.P.Wayne, Photochemistry, Butterworths, London (1970).

B.J.Mc Clenlland, Statistical Thermodynamics, Chapman and Hall, London (1973).

Cleyde, Physical Chemistry, Schaum Series, Mc Graw Hill (1976).

Dole, Thermodynamics, Prentice Hall, New York (1954).

Prigogine, Introduction to Thermodynamics of Irreversible Process, Interscience, New York (1961).

N.O.Smith, Elementary Statistical Thermodynamics - A Problem Approach, Plenum Press, NewYork (1961).

Course	: M.Sc. Chemistry	**Semester**	: 4th semester
Subject	: Applied Chemistry	**Batch**	: 2017 – 2018 Onwards
Subject code	: 17P4ECH	**Credit**	: 4

Broad objectives

To enable the students

- ➢ To develop the ability for applying the principles of chemistry.
- ➢ To appreciate the achievements in chemistry and to know the role of chemistry in nature
- ➢ and in society.
- ➢ To familiarize the emerging areas of chemistry and their applications in various spheres
- ➢ of chemical sciences and to apprise the students of its relevance in future studies.
- ➢ To develop skills in the proper handling of instruments and chemicals.
- ➢ To be exposed to the different processes used in industries and their applications.

UNIT I: SUSTAINABLE CHEMISTRY IN ORGANIC SYNTHESIS

Transition metal catalyzed coupling reactions (Pd, Fe, Mg). Cross-coupling, Homo-coupling reactions: Ulmann coupling & condensation, Kumada, Negishi, Fukuyama, Glaser & Hay, Hiyama-Denmark, Mozoriki-Heck, Stille, Suzuki-Miyaura, Sonogashira, Buchwald-Hartwig, and Chan-Lam reactions. Metathesis - Olefin, alkyne, ring closing, ring opening and multiple metathesis; Application in synthesis of pharmaceutically important molecules.

UNIT II: TEXTILE CHEMISTRY

Dyeing – classification of colorants – fastness properties of dyes- direct, reactive, vat, sulphur, azoic, acid, basic, disperse and natural dyes- properties and application on suitable material. Dyeing defects, causes and remedies. Evaluation of fabrics - absorbency, whiteness, chemical change and degradation.

UNIT III: TANNERY EFFLUENT

Types and characteristics of tannery effluent from beam house processes, tan yard processes and finishing processes, nature and pre-treatment before disposal, Most toxic ingredients- hazards of tannery effluent, principles involved in removing their toxic effect from waste water. Aerobic and anaerobic oxidation - Sedimentation, coagulation, filtration, disinfection, desalination and ion exchange. Primary treatment – Secondary treatment - Trickling filters, activated sludge process and sludge digestion - Tertiary treatment – USAB process and deep well injection.

UNIT IV: HERBAL DRUGS

Pharmacological screening of Herbal drugs- Introduction and evaluation of herbal drugs for antidiabetic, hepatoprotective, diuretic, anti-diarrhocal, antiulcer, wound healing, cardiovascular, anti-inflammatory, analgesic, antipyretic, antifertility, anti-oxidant, anti-viral & cyto-toxic properties.

UNIT V: 5. INSTRUMENTAL METHODS OF CHEMICAL ANALYSIS

Principle, Instrumentation, and applications of Atomic Emission Spectroscopy (AES), in qualitative and quantitative analysis. Principles, instrumentation and applications of plasma spectroscopy, and Inductively Coupled Plasma- Mass Spectroscopy (IC-PMS). Principle, Instrumentation, applications of Scanning electron microscopy (SEM), Scanning Tunneling Microscopy (STM) and Applications of XRD, DSC and DTA in the characterization of pharmaceutical solids.

REFERENCE BOOKS

1. Kurti L., Czako, B. Strategic Applications of Named Reactions in Organic Synthesis: Elsevier Academic Press 2005.
2. Organic chemistry, Second edition, Janice Gorzynski Smith, University of Hawai'
3. Environment & Tannery- M.C.C. Carre et.al. Center technique du cuir, Lyon, France.
4. Waste water engineering, treatment, disposal reuse- Metcalf & Eddy- Tata Mcgraw Hill
Publishing Co. Ltd. New Delhi.
5. Standard Methods for the Examination of Water & Waster Water- American Public Health
Association, Washington, D.C.
6. An Introduction to the Principles of Leather Manufacture, 3rd edition- S.S.Dutta,
Chap.XXVI, I.L.T.A., Kolkata.
7.Role of Biotechnology in Medicinal and Aromatic plants, Vol-XIII, Ukaaz Publications,
Hyderabad.
8. Supplement to cultivation and utilization of medicinal plants, S.S.Handa and M.K.Kaul, RRL
Jammu.
9. Chemistry of Natural Products, by O.P.Agarwal, Vol-I & II
10. Instrumental methods of analysis H.H.Wilard,L.L.Merritt, J A Dean.
11. Analytical Chemistry G.D. Chritiain. Wiley.
12. Introduction of instrumental analysis. R.P.Braun.

Course	**: M.Sc. Chemistry**	**Semester**	**: 4th semester**
Subject	**: Organic Chemistry Practical-II**	**Batch**	**: 2017 – 2018 Onwards**
Subject code	**: 17P4CHPR4**	**Credit**	**: 4**

I. ANY SIX PREPARATIONS FROM THE FOLLOWING INVOLVING TWO STAGES

1. sym-Tribromo benzene from aniline.

2. Benzanilide from benzophenone

3. m-Nitro benzoic acid from methyl benzoate

4. 2,4.- Dinitrobenzoic acid from p-nitrotoluene

5. m-Nitro benzoic acid from benzaldehyde

6. Benzil form benzaldehyde

7. Anthraquinone from phthalic anhydride

8. Phthalide from phthaic anhydride

9. 2-Phenyl indole from phenyl hydrazine

10. 2, 4 dinitrophenyl hydrazine from p-nitrochlorobenzene

II. ANY TWO EXERCISES IN THE EXTRACTION OF NATURAL PRODUCTS

1. Caffeine from tea leaves

2. Lactose from milk

3. Citric acid from lemon

4. Piperine from black pepper

III. CHROMATOGRAPHIC SEPARATIONS

1. Column chromatography - separation of anthracene and picric acid from anthracene   picrate.

2. Thin layer chromatography separation of green leaf pigments.

3. Paper chromatography

Identification of amino acid**.**

IV. ANY FIVE ESTIMATION

      1. Estimation of aniline
      2. Estimation of phenol
      3. Estimation of glucose
      4. Estimation of amino group
      5. Estimation of amide group
      6. Sapanification of fat or an oil
      7. Iodine value of an oil
      8. Estimation of sulphur in an organic compound
      9. Estimation of ketone (Demo)

V.   SPECIAL INTERPRETATION OF ORGANIC COMPOUNDS USING UV, IR, PMR AND MASS SPECTRA OF THE FOLLOWING 15 COMPOUNDS

1,3,5- Trimethyl benzene
Pinacolane
n-Propylamine
p-Methoxy benzyl alcohol
Benzyl bromide
Phenylacetone
2-Methoxyethyl acetate
Acetone
Isoopropyl alcohol
Acetaldehyde diacetate
2-N,N-Dimethylamino ethanol
Pyridine
4-Picoline
1,3-dibromo - 1, 1- dichloropropene
Cinnamaldehyde

Recommended Books

1. A text book of Practical Organic Chemistry by Arthur I.Vogel

2. Laboratory Manual of Organic Chemistry Raj K. Bansal, Wiley Eastern limited.

3. Laboratory manual of Organic Chemistry by Mann and Saunders.

Mark Distribution

Examination	Marks
Estimation	25
Preparation	25
Interpretation of spectra	10
Viva Voce	10
Record	05
Total	**75**

CONTINUOUS INTERNAL ASSESSMENT MARKS (CIA MARK)
MAX. MARKS = 25

Evaluation method for practical paper:

Distribution of Marks

Internal assessment	Marks
Two Tests	10
Results accuracy	10
Attendance/ Regularity	5
Total	**25**

Course : **M.Sc. Chemistry** **Semester** : **4th semester**
Subject : **Inorganic Chemistry Practical-II** **Batch** : **2017 – 2018 Onwards**
Subject code : **17P4CHPR5** **Credit** : **4**

1. Analyse systematically the given inorganic mixture to estimate volumetrically and gravimetrically

Mark Distribution

Examination	Marks
I. Estimation of mixture containing two metal ions	
procedure	5
Volumetric analysis	15
Gravimetric analysis	10
II. Preparation	
Quality & Quantity	15
Procedure	5
III. Interpretation of spectra	10
Viva Voce	10
Record	05
Total	**75**

CONTINUOUS INTERNAL ASSESSMENT MARKS (CIA MARK) MAX. MARKS = 25
Distribution of Marks

Internal assessment	Marks
Two Tests	10
Results accuracy	10
Attendance/ Regularity	5
Total	**25**

Course	: M.Sc. Chemistry	**Semester**	: 4th semester
Subject	: Physical Chemistry Practical-II	**Batch**	: 2017 – 2018 Onwards
Subject code	: 17P4CHPR6	**Credit**	: 4

EXPERIMENTS IN ELECTROCHEMISTRY:
CONDUCTOMETRY, POTENTIOMETRY, PH METRY AND SPECTROSCOPY.

I.CONDUCTIVITY MEASUREMENTS

1. Determination of equivalent conductance of a strong electrolyte and verification of Debye - Huckel - Onsager Equation
2. Verification of Debye-Huckel limiting law
3. Verification of Ostwald's Dilution law for a weak electrolyte.
4. Determination of pK_a values of weak acids and weak bases.
5. Conductometric titrations between acid (simple and mixture of strong and weak acids) - base,
6. Precipitation titrations including mixture of halides.

II. E.M.F MEASUREMENTS

1. Determination of standard potentials (Copper, Silver & Zinc)
2. Determination of thermodynamic quantities from EMF measurements –
3. Potentiometric titrations – Neutralization reactions
4. Determination of pH of buffer solution and calculation of pK_a.
5. Determination of stability constant of a complex.
6. Determination of solubility product of a sparingly soluble salt.
7. Potentiometric titrations – Redox titrations.
8. Potentiometric titrations – Precipitation titration of mixture of halides by EMF measurements.

III. SPECTROSCOPY: INTERPRETATION OF SPCTRA

1. Experiments given only to familiarize the interpretation of spectra provided.
2. Interpretation of UV-Visible spectra of simple molecules for the calculation of molecular data
3. Identification of functional groups (5 typical spectra will be provided).
4. IR and NMR spectral calculations of force constant and coupling constants respectively
5. Identification and interpretation of a spectra (5 each in IR and NMR will be provided)

LIST OF EXPERIMENTS SUGGESTED FOR PHYSICAL CHEMISTRY PRACTICAL II

Typical list of possible experiments are given.
Experiments of similar nature and other experiments may also be given.
The list given is only a guideline.
Any 15 experiments have to be performed in a year.

1. Determination of the equivalent conductance of a weak acid at different concentrations and verify Ostwald's dilution law and calculate the dissociation constant of the acid.
2. Determination of equivalent conductance of a strong electrolyte at different concentrations and examine the validity of the Onsager's theory as limiting law at high dilutions.
3. Determination of the activity co-efficient of Zinc ions in the solution of 0.002M Zinc sulphate using Debye-Huckel limiting law.
4. Determination of the solubility product of silver bromate and calculate its solubility in water and in 0.01 M $KBrO_3$ using Debye-Huckel limiting law.
5. Conductometric titrations of a mixture of HCl, CH_3COOH and $CuSO_4$ and NaOH.
6. Determination of the dissociation constant of an acid at different dilution.
7. Determination of the solubility of the lead iodide in water , 0.04 M KI and 0.04 M $Pb(NO_3)_2$ at 298 K
8. Determination of the solubility product of leadiodide at 298 K and 308 K and calculate the molar heat of solution of lead iodide.
9. Compare the relative strength of acetic acid and mono chloroacetic acid by conductance method.
10. Determine the basicity of organic acids (oxalic /benzoic).
11. Determine the electrode potentials of Zn and Ag electrodes in 0.1M and 0.001M solutions at 298 K and fine the standard potentials for these electrodes and test the 12.
12. Determine the activity co-efficient of an electrolyte at different molalities by EMF measurements.
13. Determine the dissociation constant of acetic acid titrating it with sodium hydroxide using quinhydrone as an indicator electrode and calomel as a reference electrode.
14. Study of the electrolytic separation of metals (Ag, Cu, Cd and Zn)
15. Determine the strength of a given solution of KCl using differential potentiometric titration technique.
16. Determine the dissociation constant of acetic acid in DMSO, DMF, acetone and dioxane by titrating it with KOH.
17. Determine the transport number of Ag ions and nitrate ions by Hittorf's method.
18. Determine the transport number of cadmium ions and sulphate ions by measuring emf of concentration cells with and without transference.
19. Determine the dissociation constant of monobasic or dibasic acid by all the Alber-Serjeant method.
20. Determine the pH of the given solution with the help of indicators using buffer solutions and by colorimetric method.
21. Perform acid-base titration in a non aqueous medium.
22. Determine the pH of a given solution by EMF method using glass and calomel electrodes and evaluate pKa value of an acid.
23. Determine the pH of a given solution by emf methods using hydrogen electrode and quinhydrone electrode.
24. Estimate the concentration of cadmium and lead ions by successive reduction in polarography. Verify Illkovic equation.
25. Determine lead ion by amperometric titrations with potassium dichromate.
26. Determine ferric ion by amperometric titration.

27. Determine pH value of an acid-base indicator (methyl red) by colorimetry.
28. Determine the composition and instability constant of a complex by mole ratio method.
29. By colorimetry determine simultaneously Mn and Cr.
30. Study the effect of solvent on the conductivity of $AgNO_3$/acetic acid and determine the degree of dissociation and equilibrium constant in different degree of dissociation and mixtures (DMSO, DMF, dioxane, acetone, water) and test the validity of Debye-Huckel Onsager's equation.
31. Determine the solubility of $Ca(TiO_3)_2$ in deionised water and in dilute solution of KCl at 298 K. Determine the solubility product graphically.
32. Determine the equivalent conductivity of a Ca electrolyte and dissociation constant of the electrolyte.
33. Determine the equivalent dissociation constant of a polybasic acid.
34. Calculate the thermodynamic parameters for the reaction $Zn + H_2SO_4$ gives $ZnSO_4 + H_2$ by emf method.
35. Determine the formation constant of silver-ammonia complex and stoichiometry of the complex potentiometrically.
36. Determine the stability constant of a complex by polarographic method.
37. Determine the g value from a given ESR spectrum.

Mark Distribution

Examination	Marks
Procedure	10
Manipulation	25
Result	15
Interpretation of spectra	10
Viva Voce	10
Record	05
Total	**75**

CONTINUOUS INTERNAL ASSESSMENT MARKS (CIA MARK)
MAX. MARKS = 25

Evaluation method for practical paper:

Distribution of Marks

Internal assessment	Marks
Two Tests	10
Results accuracy	10
Attendance/ Regularity	5
Total	**25**

MUTHURANGAM GOVT.ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SYLLABUS UNDER CBCS

M.PHIL.,CHEMISTRY SYLLABUS
FOR CANDIDATES ADMITTED FROM 2017-2018 ONWARDS
MARCH-2017

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SYLLABUS UNDER CBCS

RESOLUTION OF BOARD OF STUDIES IN M.Phil COURSE IN CHEMISTRY

The board of Studies in M.Phil Chemistry have scrutinised the syllabus for I^{st} Semester to IInd Semester papers of M.Phil.,Chemistry Course held on the FN of 23-03-2017 and resolved the following

The Board resolved to approve and pass syllabus for M.Phil course on Chemistry for I^{st} semester to IInd semester theory and Project

Course   : **M.Phil. Chemistry**   **Semester**   : **1ˢᵗ semester**
Subject   : **Research Methodology**   **Batch**   : **2017 – 2018 Onwards**
Subject code : **17MPCH1**   **Credit**   :

UNIT-I

Research techniques and statistics

Web search and web publishing – Literature survey using internet – web resources – journal access through web – digitized and digital formats – E – journals – e-journals Consortium – UGC –Infonet – E-books – Online and digital libraries – Useful web links – Search engines Alta vista, google, yahoo search – Wikis – Scifinder – Scopus – Science Direct – Citation index – impact factor– H – index, Google, Scholar, Research gate, n-link

Errors in chemical analysis – classification of errors – determination of accuracy of methods – improving accuracy of analysis – significant figures – mean, standard deviation – comparison of results : "t" test, "f" test and "chi" square test – rejection of results – presentation of data. Sampling – introduction – definitions – theory of sampling – techniques of sampling – statistical criteria of good sampling and required size – stratified sampling vs random sampling – minimization of ariance in stratified sampling – transmission and storage of samples.

UNIT-II

Organic synthesis

Introduction – Retro synthesis one group disconnection, 1,2-1,3-1,4-1,5 and 1,6 – difunctional disconnections – stereoselectivity, regioselectivity, protecting groups, use of aliphatic nitro compounds in organic synthesis – Asymmetric synthesis – strategy classification of methods, enantiomeric excess and diastereomeric excess – first, second, third and fourth generation processes, Enantioselective asymmetric synthesis.

Green Chemistry – Principles of green chemistry – green solvents – solventless reactions – solid state catalysts – non-toxic catalysts – Ionic liquids – microwave arrested reactions.

UNIT-III

Analytical Techniques

Principle, Instrumentation, Applications, Analysis and Interpretation of the data for the following techniques.

UV-Visible Spectrophotometry, IR, GCMS TG-DTA, Nuclear Analytical Techniques, Fluorimetry, NMR, AAS, ICPAES, XRD.

UNIT-IV

Chemical safety and Disaster Management

Emergency response : chemical spills, radiation spills, biohazard spills, leaking compressed gas cylinders, fires, medical emergency accident reporting.

General safety : General safety and operational rules, safety equipments, personal protective equipments, compressed gas safety, safety practices for disposal of broken glass wares, centrifuge safety, treated biomedical wastes and scientific ethics.

Research problem : meaning of research problems, sources of research problems, criteria characteristics of a good research problem, errors in selecting a research problem.

Hypothesis : Meaning types of hypothesis.

Developing a Research Proposal : Format of research proposal, individual research proposal and institutional proposal.

Research Report : Format of the research report, style of writing the report, references and bibliography.

Unit-v

Research sources

Sources of chemical information : primary, secondary, and tertiary sources. Indexes and abstracts in science and technology : applied science and technology, index, biological abstracts, chemical abstracts, chemical titles, current chemical reactions, current contents, engineering index, index chemicus, index medicus, physics abstracts, science citation index. Classical and comprehensive reference works in chemistry Beilstein, compilataions of data, synthetic methods and techniques, treat ises, reviews, funding agencies-(major and minor)

References:

- Ron Mansfield, Working in Microsoft Office, Tata McGraw-hill Publishing Company Limited, New Delhi, 1996.
- Gray D.Christian, Analytical Chemistry, 6th edition, John Wiley & Sons.lnc., New York, 2004.
- Ahluwalia, Kidwai, New Trends in Green Chemistry, 2nd edition, Anamaya Publishers, New Delhi, 2006.
- Makie R.K.Smith D.M.Aitken R.A., Guide Books to Organic Synthesis, 3rd edition, Longman 1999.
- J.W.Best, Research in Education, 4th ed. Prentice Hall of India, New Delhi, 1981.

Course	: **M.Phil. Chemistry**	**Semester**	: **1st semester**
Subject	: **Modern Instrumental Techniques**	**Batch**	: **2017 – 2018 Onwards**
Subject code	: **17MPCH2**	**Credit**	:

UNIT-I

Thermal analytical methods: Basic principles of differential thermal analysis and thermo gravimetric analysis – Instrumentation, DSC, DTG, DMA

UNIT-II

Polography and amperometry : Basic principles – migration current – diffusion current and half wave potential – application to organic compounds-SEM, TEM (Surface Analysis)

UNIT-III

Determination of refractive index and dielectric constant. Determination of dipole moments. Determination of magnetic susceptibility – Guoy balance and Faraday balance.

UNIT-IV

Optical Spectroscopy – General instrumentation – radiant energy sources – dispersion devices – photosensitive detectors. Types of spectrophotometers – Ultraphotometers – Ultraviolet and visible absorption and molecular structure. Qualitative methods – IR spectra – Raman spectra – flame photometry. Optical rotatory dispersion studies – Cotton effect – Axial haloketone rule and Octant rule.

UNIT-V

Nuclear magnetic and electron paramagnetic resonance spectrosocopy. Principles of NMR spectrometer. Sample handling. Correlation of spectra with structure. Principles of ESR spectroscopy – Instrumental. Hyperfine splitting.

Mass spectrometer- ion source – ion collecting system vacuum system. Resolution – molecular identification. Qualitative analysis of mixtures.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2

MODEL QUESTION PAPER- MODERN INSTRUMENTAL TECHNIQUES

Duration : 3 Hours   **Maximum : 75 Marks**

Part-A (5x5=25)Marks

Answer all questions

1.(a) Write a note on the balance used in TGA

    (OR)

1.(b) Explain the factors that affect the thermo gravimetric curve

2.(a) Explain enlatging currents in polarography.

    (OR)

2.(b) Discuss polarographic maxima and its elimation

3.(a) Discuss the determination of magnetic susceptibility by Guoy balance method

    (OR)

3.(b) Explain a method for the determination of refractive index.

4.(a) Explain Doppler Broadening in atomic spectroscopy

    (OR)

4.(b) Explain optical rotatory dispersion

5.(a) What is the importance of g-factor in ESR?

    (OR)

5.(b) Write a note on chemical shift in NMR.

Part-B(5x10=50)

Answer all questions

6.(a) (i) What is the difference between TGA DTA

    (ii) Describe the application of TGA

        (OR)

7. (b) (i) What is the principle to involve in the DTA analysis?

   (ii) Describe the instrumentation involved in DTA analysis

8.(a) (i) What is the advantage of three electrode assembles in polarography?

   (ii) Describe the different ypes of amperometric titrations.

               (OR)

9.(b) (i) What is meant by migration current? How is it eliminated in polarographic analysis?

   (ii) Explain the applications of polarography

10.(a)(i) Write a note on dipole moment

   (ii) Describe a method for the determination of dipole moment.

Course	: **M.Phil. Chemistry**	**Semester**	: **1st semester**
Subject	: **Internal Paper**	**Batch**	: **2017 – 2018 Onwards**
Subject code	: **17MECH**	**Credit**	:

Unit – I :

Types of electronic spectra of transition metal complexes – selection rules: spin, symmetry and many electron transition rules – relaxation of Laporte rule: vibronic coupling, d-p mixing and symmetry lowering – relaxation of spin selection rule. spin – orbit coupling, Jahn – Teller distortion. Comparison between d-d bands and CT bands. Applications of Infrared spectroscopy to metal complexes. Applications of EPR based on number of signals multiplicity - Explanation of EPR spectra of transition metal complexes.

Unit – II :

Reactions medium - Phase transfer catalysis – novel solvents for organic reactions – reactions in highly polar solvents – ionic liquids – special features- advantanges and disadvantages – Bead Chemistry – multiple synthesis – MOS apparatus – Combinatorial chemistry – Mix and Split synthesis – small molecules libraries – SPOS - Solid phase reagents .

UNIT –III

Sonochemistry – instrumentation- physical aspects – homogeneous reactions- heterogeneous liquid-liquid and liquid – solid reactions   - synthetic applications –Esterification – addition reactions –hydrosilation – hydroalkylation – coupling reactions – Bouveault reaction – Barbier reaction of carbonyl compounds - Reformatsky reaction and condensation.

UNIT - IV

Crystal field theory and its limitation, d-orbital splitting, LFSE, spectro chemical series, concept of weak and strong, fields, Jahn-Teller distortion, charge-transfer spectra. Evidence for metal Ligand orbital overlap, molecular orbital theory and energy level diagram, d-d transitions, Orgel and Sugano-Tanabe diagrams, Spin orbit coupling,   nephelauxetic effect, spectra, and magnetic characteristics of transition metal complexes. Electron transfer reactions – Outer and Inner sphere processes – Atom transfer reaction, Formation and rearrangement of precursor complexes – Binding ligand – Successor complexes – Marcus theory.

UNIT - V : Polymer Chemistry:

Structure and Properties of Polymers – strength, crystallinity, thermal stabiliy– Techniques of Polymerization – Bulk, Solution, Emulsion, Suspension etc – Spectroscopy of Polymers – interpretation of IR, ^{13}C NMR, ^{1}H NMR, thermal analysis (TGA, DTA, DSC, DMA). Polymer supports and it's applications – Synthetic Utility, Reagents, Catalysts, Column materials. Hydrogels and its applications

References:

01. Advanced Inorganic chemistry- 6th Edition - F. Albert Cotton, Geoffrey Wilkinson, Carlos A. Murillo, Manfred Bochmann

02. Organic chemistry – An advanced University course – Part – I by R. Balaji Rao – Vishal Publishing Co. Jalandhar- Delhi.

03. Organic synthesis – Special Techniques – V.K. Ahluwalia & Renu Aggarwal – Narosa Publishing House, New Delhi.

04. Advanced Inorganic chemistry –A Comprehensive text – Cotton & Wilkinson

05. Polymer Science and Technology – Plastics, Rubbers, Blends and Composites, Premamoy Ghosh, 2nd Edition, 2005, Tata McGraw Hill, NewDelhi.

06. Principles of Polymer Chemistry – G.Odian

07. Text book of Polymer Chemistry – Billmayer

08. Text book of Polymer Science – Gowarikar, Viswanathan

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS) VELLORE -2

B.Sc Computer Science

CBCS Pattern (with effect from 2017-2018)

S. NO	Part	Study components Course Title		In hrs / Week	Credit	Title of the Paper	Maximum		
							CIA	Uni Exam	Total
SEMESTER I							CIA	Uni Exam	Total
1	I	Language	Paper 1	6	4	Tamil	25	75	100
2	II	English	Paper 1	6	4	English	25	75	100
3	III	Core Theory	Paper 1	6	6	Programming in C & C++	25	75	100
4	III	Core Practical	Practical -1	3	2	Programming in C & C++ Lab	25	75	100
5	III	Allied I	Paper 1	7	4	Physics	25	75	100
6	IV	Environ. Studies		2	2	Environmental studies	25	75	100
				30	**22**		**150**	**450**	**600**
SEMESTER II							CIA	Uni Exam	Total
7	I	Language	Paper 2	6	4	Tamil	25	75	100
8	II	English	Paper 2	4	4	English	25	75	100
9	III	Core Theory	Paper 2	6	6	Data Structures	25	75	100
10	III	Core Practical	Practical -2	3	2	Data Structures Lab	25	75	100
11	III	Allied I	Paper 2	7	6	Physics	25	75	100
12		Allied I	Allied Practical I	3	2	Allied Physics Practical	25	75	100
13	IV	Soft Skill		2	2	Soft Skill	25	75	100
14	IV	Value Education		2	1	Value Education	25	75	100
				33	**27**		**200**	**600**	**800**

						SEMESTER III	CIA	Uni Exam	Total
15	I	Language	Paper 3	6	4	Tamil	25	75	100
16	II	English	Paper 3	6	4	English	25	75	100
17	III	Core Theory	Paper 3	3	3	Programing in JAVA	25	75	100
18	III	Core Practical	Practical -3	3	3	Programing in JAVA & HTML Lab	25	75	100
19	III	Allied II	Paper 3	4	4	Maths	25	75	100
20	IV	Skill Based Sub I	Paper 1	3	3	Introduction to HTML & Java Script	25	75	100
21	IV	Non- Major Elective I	Paper 1	2	2	Introduction to Information Technology	25	75	100
				27	**23**		**175**	**525**	**700**

						SEMESTER IV	CIA	Uni Exam	Total
22	I	Language	Paper 4	6	4	Tamil	25	75	100
23	II	English	Paper 4	6	4	English	25	75	100
24	III	Core Theory	Paper 4	3	3	Digital Logic & Microprocessor	25	75	100
25	III	Core Practical	Practical -4	3	3	Microprocessor & Multimedia Lab	25	75	100
26	III	Allied II	Paper 4	4	4	Maths	25	75	100
27	IV	Skill Based Sub I	Paper 2	3	3	Multimedia	25	75	100
28	IV	Non- Major Elective II	Paper 2	2	2	Internet and its Applications	25	75	100
				27	**23**		**175**	**525**	**700**

						SEMESTER V	CIA	Uni Exam	Total
29	III	Core Theory	Paper 5	5	3	Software Engineering	25	75	100
30	III	Core Theory	Paper 6	5	3	DBMS	25	75	100
31	III	Core Theory	Paper 7	4	2	Open Source Software	25	75	100

32	III	Core Practical	Practical -5	4	3	DBMS Lab	25	75	100
33	III	Core Practical	Practical -6	4	3	Open Source Program Lab	25	75	100
34	III	Elective I	Paper I	4	3	Computer Networks	25	75	100
35	IV	Skill Based Sub I	Paper 3	4	3	Cloud Comupting	25	75	100
				30	**20**		**175**	**525**	**700**

		SEMESTER VI					CIA	Uni Exam	Total
36	III	Core Theory	Paper 8	5	5	XML & Web Services	25	75	100
37	III	Core Theory	Paper 9	5	4	Operating Systems	25	75	100
38	III	Core Practical	Practical -7	4	3	Operating Systems Lab	25	75	100
39	III	Core Practical	Practical -8	4	3	XML & Web Services Lab	25	75	100
40	III	Elective II	Paper 2	4	3	Mobile Computing	25	75	100
41	III	Elective III	Paper 3	4	3	Software Testing	25	75	100
42	IV	Skill Based Sub I	Paper 3	4	3	Unix Shell Programming	25	75	100
43	V	Extension Activities		0	1		50	0	50
				30	**25**		**225**	**525**	**750**
							1100	**3150**	**4250**

SEMESTER I

Subject Code:17U1CS1

PAPER I

Programming in C & C++

Unit 1: Basic Elements of C – Data Types – Operator – Control Statements – Branching, Looping, Nested Control Structures – Prototypes and Functions – Parameter Passing Methods – Recursion – Storage Classes – Library Functions.

Unit 2 : Introduction to OOP – Overview of C++ - Classes – Structures – Union – Friend Functions – Friend Classes – Inline functions – Constructors – Destructors – Static Members – Scope Resolution Operator – Passing objects to functions – Function returning objects.
Arrays – Pointers – this pointer – References – Dynamic memory Allocation – functions Overloading – Default arguments – Overloading Constructors – Pointers to Functions – Ambiguity in function overloading

Unit 3: Operator Overloading – Members Operator Function – Friend Operator Function – Overloading some special operators– Inheritance – Types of Inheritance– Virtual base Class – Polymorphism – Virtual functions – Pure virtual functions.

Unit 4:– Exception Handling -Exception handling Functions – Streams – Formatted I/O with ios class functions and manipulators – creating own manipulators.

Unit 5 : File Handling - File Pointer – High Level File Operations – Opening and Closing of File – Creating, Processing and Updation on Files – Simple File Handling Programs

Text Books

1. Programming in ANSI C, Balaguruswamy .E,Tata McGraw Hill Publications, 1995.
2. Object Oriented Programming with C++ , Ashok Kamthane, Pearson Education , 2011.

Reference Books

1. B.W. Kernighan and D.M.Ritchie, The C Programming Language, 2nd Edition, PHI, 1988.
2. C++ The complete Reference, Herbert Schildt – Tata McGraw-Hill Education, 2012
3. Object Oriented Programming with C++, E. Balaguruswamy - Tata McGraw-Hill Education, 2008

SEMESTER I

Subject Code: 17U1CSPR1

PRACTICAL - I

Programming in C & C++   Lab

I. Summation of Series:

1. Sin(x), Cos(x), Exp(x) (Comparison with built in functions)
2. Counting the no. of vowels, consonants, words, white spaces in a line of text and array of lines
3. Reverse a string & check for palindrome.
4. Substring detection, count and removal
5. $^nP_r, {}^nC_r$
6. Fibonacci sequence
7. Addition & Subtraction
8. Multiplication

C++ PROGRAMS

1. Program to implement a class, create objects and member functions.
2. Program to implement the concept of function overloading.
3. Program to implement the concept of Operator overloading.
4. Program to implement the concept of Inheritance.

SEMESTER II

Subject Code: 17U2CS2

PAPER II

OBJECT ORIENTED DATA STRUCTURES

Unit-1

Object Orientation - Abstract Data Types – Algorithm Analysis: The Need for Algorithm Analysis - Asymptotic Notations – Recurrence Equations - Analysis of Linear Search. Arrays: One Dimensional Arrays-Ordered Lists – Polynomials - Representation of Arrays - Multi Dimensional Arrays.

Unit-2

Linked Lists: Singly Linked Lists - Circular Linked Lists – Doubly Linked Lists. Stacks and Queues: Implementation of Stacks - Using Arrays - Using Linked Lists - Implementation of Queues: Using Arrays - Using Linked Lists - Circular Queue - Some Application: Stack and Recursion Evaluation of Expressions.

Unit-3

Trees: Basis Terminology – Binary Trees – Binary Tree Implementations: Using arrays – Using Pointers – Traversal – Binary Tree Representation of Trees – Binary Search Trees.

Unit -4

Graphs: Definition – Representation of Graphs: Adjacency Matrix – Incidence Matrix – Adjacency List – Adjacency Multilists – Circular Adjacency Lists. Graph Traversals: Depth First Search – Breadth First Search. Shortest Path Problems: Single Source Shortest Paths – All Pair Shortest Paths.

Unit -5

Internal Sorting: optimal Sorting Time – Sorting Objects: Insertion Sort – Selection Sort – Merge sort – Quick Sort – Heap Sort. Hashing: Hash Functions – Collision Resolution: Open Hashing – Closed Hashing – Rehashing.

Text Book:

Object Oriented Data Structures Using C++ , K S Easwarakumar

SEMESTER II

PRACTICAL - II
OBJECT ORIENTED DATA STRUCTURES - LAB

1. Implement PUSH, POP operations of stack using Arrays.
2. Implement add, delete operations of a queue using Arrays.
3. Implementation PUSH, POP operation of stack using pointers.
4. Implement PUSH, POP operation of queue using pointes.
5. Creation, insertion, and deletion in Singly linked list.
6. Binary Search tree traversals (in-order, pre-order, and post-order) using Recursion.
7. Sorting – Quick sort, Merge Sort, Insertion Sort, Selection Sort.
8. DFS, BFS

SEMESTER III

Subject Code:17U2CS3

PAPER III

Programming in Java

UNIT- I

Introduction to Java - Features of Java - Object Oriented Concepts - Data Types - Variables - Arrays - Operators - Control Statements-Input and output-Scanner and System class-print(),println(), and printf() methods.

UNIT- II

Classes - Objects - Constructors - Overloading method - Access Control - Static and fixed methods - Inner Classes - String Class - Inheritance - Overriding methods - Using super- Abstract class – Type Wrapper classes for primitive types- Autoboxing and Auto Unboxing – Recursion.

UNIT- III

Packages - Access Protection - Importing Packages - Interfaces - Exception Handling - Throw and Throws - Thread – Life Cycle of a Thread- Methods in the Thread class- Setting the priority of a thread.

UNIT- IV

Input-Output Streams - File Streams – Applets.

UNIT- V

Abstract Windowing Toolkit- Drawing Lines, Rectangles and Ovals, Flowlayout, Borderlayout, Gridlayout , Frames, Menus.

Text Books

1. Programming in Java – 2nd Edition by C.Muthu, TMH Publication

2. Java How to Program by Deitel & Deitel - 6th Edition- PHI Publication 2005. Arnold and J. Gosling - The Java Programming Language Addison.

SEMESTER III

PRACTICAL III

PROGRAMMING IN JAVA & HTML LAB

1. Finding area and Perimeter of a circle. Use Scanner class.
2. Determining the order of numbers generated randomly using Random Class.
3. String Manipulation (Substring removal, string replacement etc.,)
4. Drawing Rectangles, Ovals etc using Applet.
5. Implementing Thread based applications
6. Exception Handling
7. Implementing Package concept
8. Implementing GUI based applications using Layout managers and menus.
9. Application using file streams(sequential file)
10. Application using file streams(Random file)

HTML Lab

1. Create a simple page introducing yourself how old you are, what you do, what you like and dislike. Modify the introduction to include a bullet list of what you do and put list the 5 things you like most and dislike as numbered lists.

2. Create another page about your favorite hobby and link it to (and from) your main page. Center something, and put a quote on one of your pages

3. Put an existing image on a web page. Create a table, use a heading and at least one use of row span/col. span. Color a page and some text within the page. Link to another site.

4. Write a script to create an array of 10 elements and display its contents.

SEMESTER III

Subject Code: 17U3CSSB1

PAPER I
Skill Based Sub I
Introduction to HTML
& Java Script

UNIT I

Introduction to HTML - Introduction, Features of HTML, Advantages & Disadvantages of HTML, HTML Editors, Step to Create and View HTML Document, Basic Structure of HTML Program.

UNIT II

Tags & Attributes- Nesting of Tags, Classification of HTML Tags, Block Formatting Tags. List - Introduction to Lists, Unordered List, Ordered List, Definition List, Nested List, Difference Between Ordered and Unordered List.

UNIT III

Linking - Introduction, Type of Hyperlink Creation, Working with Links, Pathname and Types, Types of Linking or Anchors. Graphics in Web Page - Image Tag, Align Images, Embedding Inline Images and External Images,

UNIT IV

Tables - Basic table tags and their related attribute. Frames - Frames, <Frame> and <Frameset> tags,

UNIT V

Form designs - Form Controls : Text, Password, Radio buttons, Check boxes, Buttons, form control selection, option processing and Text area.

Text Books

Sybex, Complete HTML, 3rd Edition, Sybex, 2003.

References

C.Xavier, Web Technology and Design, TMH, 2010

SEMESTER IV
PAPER I

Subject Code: 17U4CSNM1

Non-Major Elective I
INTRODUCTION TO INFORMATION TECHNOLOGY

UNIT I

Introduction: History of Computer-Parts of computer System-Hardware Devices-Software-Operating System-Examples of Operating System-Computer Networking-Visual Editor.

UNIT-II
Microsoft Word-Microsoft Excel-Microsoft PowerPoint.

UNIT-III

Introduction to Multimedia-Images-Sound-Video Desktop Publishing Basics-Page Layout Programs-Text Generation-Graphics for DTP-Print Production.

UNIT-IV
Introduction to Internet-Working of Internet-Internet Services-Internet Addressing-E-mail Basics-Web Development Tools-Introduction to HTML.

UNIT-V
Information System-Management Information Concepts-Planning Issues and the MIS-Organizing Issues and the MIS-Control Issues and MIS-Decision Support Systems.

References

1. Sanjay Saxsena, "A First Course in Computer", Vikas Publishing House, 2000
2. Ron Mansfield, "Working in Microsoft Office", Tata Mcgraw Hill, 1997
3. Linda Twat, Sapphiro Pacific Lajolla, "Multimedia in Action", Academic Press, 1995
4. Neil randal "Teach yourself the internet in a week" Prentice Hall of India, Second Edition, 1996.

SEMESTER IV

Subject Code: 17U4CS4

PAPER IV

DIGITAL LOGIC AND MICROPROCESSOR

Unit-I: Digital Computers and Digital Systems - Binary Numbers - Number Base Conversion - Octal and Hexadecimal Numbers - Compliments - Binary Codes - Binary Logic - Integrated Circuits. Basic Definitions of Boolean Algebra - Axiomatic Definition of Boolean Algebra - Basic Theorems and Properties of Boolean Algebra -

Unit-II:

Boolean Functions - Canonical and Standard Forms - Digital Logic Gates. Simplification of Boolean Functions-The Map Method - Two and Three Variable Maps - Four Variable Map - Product of Sums Simplifications - Don't Care Conditions.

Unit-III:

Combinational Logic - Adders - Subtractors - Binary Adder – Encoder - Decoders – multiplexer and demultiplexer - Flip Flops - Registers - Shift registers-Ripple counters- Synchronous Counters - The Memory Unit.

UNIT-IV: Microprocessor:

Introduction to Intel 8086 Microprocessor – Internal Architecture of 8086 – minimum mode and maximum mode – Pin functions of 8086-Addressing Modes – Instruction set: Data transfer, Arithmetic, Logic, shift, rotate instructions.

Unit-V

Compare instructions, jump, loop, string, Flag and processor control instructions - stack and stack related instructions - call and return instructions - Assembly language programs.

Text Book

1. M. Morris Mano, "Digital Logic and Computer Design".
2. V.Vijayendran, "Fundamentals of microprocessor-8086" s.viswanathan printers and publishers pvt ltd -2012.

SEMESTER IV
PRACTICAL IV

Subject Code: 17U4CSPR4

MICROPROCESSOR AND MULTIMEDIA LAB

1. Addition of 16-bit Numbers

2. Multiplication of 16-bit Numbers

3. Division of 16-bit Numbers

4. Multibyte Addition

5. Matrix Multiplication

6. Fibonacci series generation

7. Factorial of a number

8. Linear Search

9. Bubble Sort

10. Password Check

MULTIMEDIA :

1. Create a Digital Clock Animation
2. Create a Product Animation
3. Create a Simple games Using Flash

SEMESTER IV

Subject Code:17U4CSSB2

PAPER II
Skill Based Elective II
Multimedia Using Flash

UNIT – I

Introducing Flash – Understanding the capabilities of Flash 8 – Looking at What's New in Flash 8 – Getting started with Flash 8 Action Script. Learning Action Script Basics – Introducing Action Script – Understanding the Actions Panel

UNIT – II

Constructing Action Script – Understanding data types – Using variables – Using Expressions – Working with operators – Using Comments Effectively – Working with Statements

UNIT – III

Working with functions – Understanding programming with functions – Defining custom functions – Calling functions – passing parameters – Returning a value from a function – Referencing functions – Creating anonymous functions – Understanding scope – Creating recursion – Overloading a function – Writing for reusability – Using built-in functions – Creating interval functions

UNIT – IV

Getting to know objects – Introducing objects – Displaying the Time with an object – Working with Movie Clip Objects – Displaying the Time using a Movie Clip – Creating intervals – Understanding the object class – Creating a custom class

UNIT – V

Working with arrays – Creating ordered structures – Creating arrays- Using different types of arrays – Converting arrays to lists – Creating new arrays from existing array elements – Sorting arrays – Using Numbers – Understanding number types – Converting strings to numbers

Text Book

1. Flash 8 Action Script Bible by Joey Lott and Robert Reinhardt

SEMESTER IV

Subject Code: 17U4CSE2

PAPER II

Non-Major Elective II

Internet and its Applications

UNIT- I

Introduction to Computers - Parts of Computer System – Input and Output Devices – Programming Languages – Operating System and Types.

UNIT – II

Introduction to Networking – History of Internet – History of World Wide Web – Internet Services – Internet Addressing – Web Resources.

UNIT – III

Web Browsers - Internet Explorer- Connecting to Internet - Features of Internet Explorer 6 - Searching Engines - Online help and tutorials - File Transmission Protocol (FTP) - Browser settings.

UNIT - IV

Electronic mail - Creating an E-mail id - Sending and Receiving mails - Attaching a file - Instant Messaging.

UNIT V

E-marketing - Consumer tracking - Electronic advertising – CRM - Credit card payments - Digital cash and e-wallets - Micro payments - Smart card.

Textbook

Internet and World Wide Web Third edition H.M.Deital, P.J. Deital and A.B.Goldberg-PHI

Reference Books

The Internet- Complete Reference Harley hahn, Tata McGraw hill

SEMESTER V

Subject Code: 17U5CS5

PAPER V
SOFTWARE ENGINEERING

UNIT I:
Introduction – What is software engineering? – Terminologies – Management in software development. Software Life Cycle Models -SDLC Models – Selection of a Life Cycle Model.

UNIT II:
SOFTWARE REQUIREMENTS ANALYSIS AND SPECIFICATION – Requirements Engineering – Elicitation – Analysis – Documentation.

UNIT III:
SOFTWARE PROJECT PLANNING – Size Estimation – Cost Estimation – Models – COCOMO II.

UNIT IV:
SOFTWARE DESIGN – What is design? – Modularity – Strategy of Design – Function Oriented Design – Object Oriented Design.

UNIT V:
SOFTWARE TESTING – Testing Process –Terminologies – Functional Testing – Structural Testing – Levels of Testing.

TEXT BOOK:

SOFTWARE ENGINEERING - K.K. AGGARWAL & YOGESH SINGH.

REFERENCE BOOK:

i)SOFTWARE ENGINEERING – PRESSMAN.

SEMESTER V

Subject Code: 17U5CS6

PAPER VI
DATABASE MANAGEMENT SYSTEMS

UNIT-I

Purpose of Database - Overall System Structure - Entity Relationship Model -Mapping Constraints - Keys - E-R Diagrams.

UNIT-II

Relational Model - Structure - Formal Query Language - Relational Algebra - Tuple and Domain Relational Calculus.

UNIT-III

Structured Query Language - Basic Structure - Set Operations - Aggregate Functions - Date, Numeric and Character Functions - Nested Sub queries - Relational Database Design - Pitfalls - Normalisation Using Functional Dependencies - First Normal Form-Second Normal Form-Third Normal Form-Fourth Normal Form And BCNF.

UNIT-IV

Oracle - Introduction – SQL – Data Definition Language, Data Manipulation Language, Data Control Language Commands – Integrity Constraints – SQL Built in functions- Aggregate functions - Nested queries

UNIT-V

Introduction to Visual Basic: IDE - Tool box- Basic controls (Command button, Text boxes, Labels etc.,) Message boxes- Variables data types - Determinate loops , indeterminate loops –Control statements - Function and Procedure. Data controls (DAO, ADODC) – Data Reports

Text Books

1. Abraham Silberschatz, H.F.Korth And S.Sudarshan-Database System Concepts Mcgraw Hill Publication (Unit I, II & III)

2. Oracle   (Unit IV)

3. Gary Cornell - Visual Basic 6.0 From the ground up – Tata McGraw Hill – 1999 (Unit V)

Reference Books

1.Singh-Database systems: Concepts, Design & applications, Pearson Education.

2.Gerald V.Post - DBMS-Designing And Business Applications - Mcgraw Hill Publications

SEMESTER V

Subject Code:17U5CSPR7

PAPER VII

Open Source Technologies

UNIT I
Introduction : Open Source – Open Source vs. Commercial Software – What is Linux? - Free Software – Linux Kernel.

UNIT II
Introduction: Linux Distributions – Download and Install - decisions, decisions - Linux partition Sizes - Accounts - Security – Basic Unix - Shell – Owner, groups, permissions, ownership Processes – PATH and Environment – Commands – Basic File system Essential – Useful Programs

UNIT III
Introduction - Apache - Starting, Stopping, and Restarting Apache - Modifying the Default Configuration - Securing Apache - Set User and Group - Allowing Access to Local Documentation - Creating Website - Apache control with .htaccess

UNIT IV
Introduction to MY SQL - Show Databases and Table - The USE command - Create Database and Tables - Describe Table - Select, Insert, Update, and Delete statement - Some Administrative detail - Table Joins - Loading and Dumping a Database.

UNIT V
PHP Introduction- Embeding PHP into HTML- Configuration – Language Syntax : Variables, Data Types , Operators , Flow Control – Built in PHP functions, Array, String functions - Database Access with PHP - MySQL - MySQL Functions - Inserting Records - Selecting Records - Deleting Records - Update Records.

Text Book
"Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP", James Lee and Brent Ware, Dorling Kindersley(India) Pvt. Ltd, 2008.

Reference books
"Setting up LAMP: Getting Linux, Apache, MySQL, and PHP and working Together", Eric Rosebrock, Eric Filson, Published by John Wiley and Sons, 2004.

Subject Code:17U5CSPR5

PRACTICAL- V

DBMS LAB

Using SQL

1. Creating and Manipulating a Table.
2. Querying a Table with Selection, Projection and Ordering.
3. Manipulating with Functions and Operators.
4. Manipulation with Multiple Tables.
5. Creating, Querying and Manipulation with Views.

Using PL/SQL

1. Program Control Statements
2. Procedure and Functions
3. Triggers.
4. Database Access using Cursors.
5. Packages.

SEMESTER V

Subject Code: 17U5CSPR6

PRACTICAL - VI

OPEN SOURCE PROGRAM LAB

1. PHP program using the concept of conditional statement
2. PHP program using the concept of loops
3. Program to set, delete and access cookies
4. PHP program to use the concept of arrays
5. PHP program using string function
6. Program to connect PHP with MYSQL
7. Designing PHP form with different form elements

SEMESTER V

Subject Code:17U5CSE1

PAPER I

ELECTIVE - I

COMPUTER NETWORKS

UNIT I
Introduction to Computer Networks – Line Configuration-Topology-Transmission Mode-Categories of Networks - Reference Models: The OSI Reference Model – TCP/IP Reference Model - Comparison

UNIT II
Physical & DataLink Layer : Physical Layer: Transmission Media(Magentic Media-Twisted pair – Coaxial cable- Fiber optics) – Wireless Transmission(Satellite communicatiuon-Cellular Telephony) - Data Link Layer: Design Issues – Error Detection and Correction – Elementary Data Link Protocol

UNIT III
Network Layer: Design Issues – Routing Algorithms: The Optimality principles – Shortest Path Routing – Flooding – Distance Vector Routing – Congestion Control Algorithms – Network Layer in the Internet: The IP Protocol – IP Address – Subnets – Internet Control Protocols.

UNIT IV
Transport Layer: The Transport Service – Elements of Transport Protocols – The Internet Transport Protocols (TCP and UDP).

UNIT V
Application Layer – Domain Naming System – World Wide Web - Client Side – Server Side.

Text Books :
1. Andrew S. Tanenbaum, Computer Networks, PHI, 1999.
2. Forouzan : INT to Data Communication & Networking, McGraw-Hill, 1998.
3. William Stallings, Data and Computer Communications Fifth Edition , Prentice Hall of India, 1997Andrew S. Tanenbaum, Computer Networks, PHI, 1999.

References:
1.Ulysess D. Black Data Communications and Distributed Networks Third Edition, 1997. Prentice Hall of India.
2.Prakash C.Gupta,Data Communications, Prentice Hall of India,1996.

SEMESTER V

Subject Code:17U5CSSB3

PAPER III
SKILL BASED SUB III
CLOUD COMPUTING

UNIT I:
Cloud Computing Basic – Overview – Applications – Intranets and the cloud – First movers in the cloud – Benefits – Limitations – Security – Regulatory Issues.

UNIT II:
Cloud Computing with the Titans – Google - EMC – NetApp – Microsoft – Amazon - Clients – Security -Network .

UNIT III:
Accessing the Cloud – Platforms – Web Applications –Web APIs – Web Browsers. Cloud Storage – Overview - Cloud Storage Providers.

UNIT IV:
Standards and Service   - Applications – Client- Infrastructure – Service.
Software as a Service – Overview -Driving Forces – Company – Industries

UNIT V:
Developing Applications – Google- Microsoft – Intuit – Cast Iron Cloud – Burgee connect - Development .

TEXT BOOK:

CLOUD COMPUTING   A Practical Approach – Anthony T.Velte, Toby J.Velte, Robert Elsenpeter , TATA McGraw – HILL EDITION

REFERENCE BOOKS:

i) CLOUD COMPUTING - Michael Miller PEARSON EDITION
ii)CLOUD COMPUTING BEST PRACTICES – Haley Bear.

SEMESTER VI

Subject Code: 17U6CS8

PAPER VIII

XML & WEB SERVICES

UNIT I

Introduction: What are Web Services? SOAP WSDL UDDI – Why was a service are important? – The evolution of web applications Not Just another distributed Computing platform – Web Services and enterprises. XML Fundamentals: The Lingua Franca of Web Services – XML Documents – XML namespaces Explicit and Default namespaces, inheriting namespaces, and not inheriting namespaces, Attributes and namespaces

UNIT II

XML Schema XML Schema and namespaces, A First Schema, Implementing XML Schema types, The any Element, Inheritance, Substitution groups, Global and local type declarations, Managing Schemas, Schemas and instance documents, XML Schema best practices. SOAP: SOAP Messages – SOAP Encoding – RPC

UNIT III

WSDL: WSDL – Using SOAP WSDL - UDDT at glance – The UDDI Business registry – UDDI under the covers – Accessing UDDI – How UDDI is playing out

UNIT IV

Conversations: Overview – Web Services Conversation Language – WSCL Interface components – The Bar Scenario Conversations – Relationship between WSCL and WSDL

UNIT V

Workflow – Business Process Management – Workflows and Workflow Management Systems-Business Process Execution Language for Web Services

TEXT BOOK

Sandeep ChatterJee, James webber, "Developing Enterprise web services". Pearson

REFERENCE BOOK

Frank, P.Coyle, XML, Web Services and the Date Revolution, Pearson Education, 2002.

SEMESTER VI

Subject Code: 17U6CS9

PAPER IX

OPERATING SYSTEMS

UNIT-I

Introduction – Types of Operating Systems - Operating System Services - System Calls and System Programs.

UNIT-II

Process Management - Process Concepts - Process Scheduling - Operation on Process -Inter Process Communication - CPU Scheduling: Scheduling Algorithms – Deadlocks -Deadlock Characterization- Deadlock Prevention-Deadlock Avoidance-Safe State.

UNIT-III

Memory Management : Contiguous Memory Allocation – Paging -Segmentation - Virtual Memory Management: Demand Paging and Page Replacement Algorithms

UNIT-IV

Information management : File Concept - Access Methods - Directory Structure - Allocation Methods - Free Space Management - Disk Scheduling.

UNIT-V

Linux System: Introduction - History- Design Principles-Kernel Modules-Process Management.

Text Book

Abraham Silberschatz and P. B. Galvin - Operating system concepts - Addison Wesley Publication.

SEMESTER VI

Subject Code: 17U6CSPR7

PRACTICAL – VII
OPERATING SYSTEMS LAB

1. Creation of a child, orphan and Zombie process.
2. IPC using pipes.
3. IPC using message queues.
4. Simulation of FCFS process scheduling.
5. Simulation of SJF process scheduling.
6. Demonstration of process synchronization using signals.
7. Demonstration of process synchronization using semaphores.

Shell Programming

8. Largest number using array
9. Smallest number using array
10. Sorting of Numbers using array
11. Sorting of names using array
12. Linear Search
13. Binary Search
14. Palindrome checking
15. Fibonacci Series
16. Prime Number Checking
17. Factorial of given number
18. Greatest common divisor
19. Counting of Vowels, consonants, digits, uppercase and lowercase letters

SEMESTER VI

Subject Code:17U6CSPR8

PRACTICAL VIII
XML & WEB SERVICES LAB

XML AND WEB SERVICES LABORATORY

1. XML document creation.
2. Importing and Exporting XML document in database.
3. XSL Transformation
4. Internal DTD creation
5. External DTD creation
6. XML Schema creation
7. Parsing XML document using DOM/SAX parser.
8. Web Service creation using JAX-WS for currency conversion
9. Web Service creation using JAX-WS for temperature conversion
10. Web Service creation using JAX-RS

SEMESTER VI

Subject Code: 17U6CSE2

PAPER II
ELECTIVE - II
MOBILE COMPUTING

UNIT I
Introduction: Mobile and Wireless Devices – Simplified Reference Model – Need for Mobile Computing – Wireless Transmission – Multiplexing – Spread Spectrum and cellular systems – Medium Access Control – Comparisons.

UNIT I1
Telecommunications System: Telecommunication System – GSM – Architecture – Sessions – Protocols – Hand over and Security – UMTS and IMT 2000 – Satellite System.

UNIT I11
Wireless LAN: IEEE S02.11 – Hiper LAN – Bluetooth – MAC Layer – Security and Link Management.

UNIT IV
Mobile IP: Goals – Packet Delivery – Strategies – Registration – Tunneling and Reverse Tunneling – Adhoc Networks – Routing Strategies.

UNIT V
Wireless Application Protocol: Wireless Application Protocol (WAP) – Architecture – XML – WML Script – Applications.

TEXT BOOK

Jochen Schiller, "Mobile Communication", Pearson Education, Delhi, 2000.

REFERENCE BOOK

"The Wireless Application Protocol: Writing Applications for the Mobile Internet", Sandeep Singhal, et al.

SEMESTER VI

Subject Code: 17U6CSE3

PAPER III
ELECTIVE - III
SOFTWARE TESTING

UNIT I :
Principles of software testing – Software Development Life cycle Models

UNIT II:
White box testing – Integration Testing – system and Acceptance Testing

UNIT III:
Testing fundamentals& Specialized testing: Performance Testing, Regression Testing- Testing of object oriented systems – scalability and accessibility testing.

UNIT IV:
Test planning, Management, Execution and Reporting.

UNIT V:
Software test Automation – Test Metrics and measurements

Text Book
Software Testing : Srinivasan Desikan, GopalswamyRamesh- Pearson education -2006

Reference Books:
1. Introduction to software testing – Louis Tamres, Addison Wesley publications – First Edition
2. Software testing, Ron Patten, SAMS Techmedia, Indian Edition 2001
3. Software Quality – Producing consistent software – Mordechai Ben Menachem, Gary S Marliss, Thomson Learning – 2003

SEMESTER VI

Subject Code: 17U6CSSB3

PAPER III

SKILL BASED SUB III

Unix Shell Programming

UNIT I

Introduction – Salient features of UNIX – Unix System Organization – Types of Shells – Creating files – Listing files and Directories.

UNIT II

Essential Unix Commands : passwd, cal, banner, touch, file, wc, sort, cut, grep, dd – I/O Direction and Piping.

UNIT III

Interactive Shell scripts – Shell variables, keywords, user-defined variables, positional parameters, Arithmetic in Shell script.

UNIT IV

Control Instructions : if-then-fi, if-then-else-fi, test, if-else, forms of if, Logical operators, Hierarchy of Logical operators, case control structure.

UNIT V

Loops – while loop – IFS – reading a file – until – for – for with command line arguments – creating nested directories – values of for loop – nesting of loops – break and continue statement.

Text Book

Yashwant Kanitkar,"UNIX Shell Programming", BPB, 2012.

References:

1. Parata," Advanced UNIX Programming guide", BPB
2. Sumitbha Das, "Unix Concepts Programming", Tata McGraw Hill

SEMESTER V

Subject Code:17U5CSE1

PAPER I

ELECTIVE - I

COMPUTER ARCHITECTURE

UNIT I

General register organization- stack organization – Instruction formats – addressing modes – data transfer and manipulation.

UNIT II

Parallel processing – pipelining – arithmetic pipeline – instruction pipeline

UNIT III

Addition and subtraction with signed magnitude – multiplication algorithms – floating point arithmetic operations

UNIT IV

Input- output interface- Asynchronous data transfer – modes of transfer – priority interrupt – direct memory access.

UNIT V

Main memory – auxiliary memory- associative memory- cache memory- virtual memory.

TEXT BOOK

1. Computer System Architecture by M. Morris Mano – Prentice Hall India – Third Edition.

RERERENCE BOOKS

1. Computer System Architecture and Parralel Processing by John P. Hayes – McGraw Hill Edition
2. Computer Organization by Hamachar, McGraw Hill Edition
3. Computer Architecture, Schaum outline series by Carter – Tata McGraw Hill Edition.

Subject Code: 12U6CSE5

Elective-III

Data Mining and Warehousing

UNIT - I

Introduction: Definition of data mining - data mining vs. query tools – machine learning –taxonomy of data mining tasks – steps in data mining process – overview of data mining techniques.

UNIT - II

Data Warehousing :Definition – Multidimensional Data Model – Data Cube – Dimension Modeling– OLAP Operations – Warehouse Schema – Data Warehouse Architecture – Data Mart – Meta Data – Types of Meta Data – Data Warehouse Backend Process – Development Life Cycle.

UNIT - III

Data Pre-Processing And Characterization :Data Cleaning – Data Integration and Transformation – Data Reduction –Discretization and Concept Hierarchy Generation – Primitives – Data Mining-Query Language – Generalization – Summarization – Analytical Characterization and Comparison - Association Rule – Mining Multi Dimensional data from Transactional Database and Relational Database.

UNIT - IV

Classification and prediction: Classification – Decision Tree Induction – Bayesian Classification – Prediction –Back Propagation – Accuracy and error measures.

UNIT - V

Cluster Analysis: Types of data – Clustering Methods – Partitioning methods – Hierarchical methods - Model based clustering methods - outlier Analysis.

Text Books

1. Paulraj Ponnaiah, Data Warehousing Fundamentals, Wiley Publishers, 2001.
2. Jiawei Han, Micheline Kamber, Data Mining Concepts and Techniques, Morgan Kaufman Publishers, 2009.

Reference Books

1. Usama M.Fayyad, Gregory Piatetsky Shapiro, Padhrai Smyth, Ramasamy Uthurusamy, Advances in Knowledge Discover and Data Mining, The M.I.T. Press, 2007.
2. Ralph Kimball, Margy Ross, The Data Warehouse Toolkit, John Wiley and Sons Inc., 2002.

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS) VELLORE -2
M.Sc Computer Science
CBCS Pattern (with effect from 2017-2018)

S. NO	Part	Study components	Course Title/ Sub. Code	In hrs / Week	Credit	Title of the Paper	CIA	Uni Exam	Total
SEMESTER I							CIA	Uni Exam	Total
1	III	Core1	17P1CS1	5	5	Design And Analysis of Algorithm	25	75	100
2	III	Core2	17P1CS2	5	4	Advanced DBMS	25	75	100
3	III	Core3	17P1CS3	5	3	Advanced Java Programming	25	75	100
4	III	Practical - 1	17P1CSPR1	5	3	Advanced DBMS Lab	25	75	100
5	III	Practical - 2	17P1CSPR2	5	3	Advanced Java Programming Lab	25	75	100
6	III	Elective - 1	17P1ECS1	5	3	1) Advanced Computer Architecture 2) System Software 3) Digital Image Processing	25	75	100
				30	21		150	450	600
SEMESTER II							CIA	Uni Exam	Total
7	III	Core 4	17P2CS4	5	4	Formal Languages and Automata Theory	25	75	100
8	III	Core 5	17P2CS5	5	4	Object Oriented Analysis and Design & UML	25	75	100
9	III	Core 6	17P2CS6	5	3	Mobile Application Development	25	75	100
10	III	Practical – 3	17P2CSPR3	5	3	CASE Tools lab	25	75	100
11	III	Practical - 4	17P2CSPR4	4	3	Android Application Lab	25	75	100
12	III	Elective - 2	17P2ECS2	4	3	1)Cryptography and Network Security 2)Software Engineering 3) Ontology Engineering	25	75	100
13	III		17P2HR	2	2	Human Rights	25	75	100
				30	22		175	525	700

							CIA	Uni Exam	Total
SEMESTER III							CIA	Uni Exam	Total
14	III	Core 7	17P3CS7	5	3	Open Source Technologies	25	75	100
15	III	Core 8	17P3CS8	5	3	Unix network Programming	25	75	100
16	III	Core 9	17P3CS9	5	4	Principles of Complier Design	25	75	100
17	III	Practical - 5	17P3CSPR5	4	3	Open Source Technologies Lab	25	75	100
18	III	Practical - 6	17P3CSPR6	4	3	Unix network Programming Lab	25	75	100
19		Practical - 7	17P3CSPR7	3	2	Mini Project	25	75	100
20	III	Elective - 3	17P3ECS3	4	3	1) Cloud Computing 2) Soft Computing 3)Data mining and Warehousing	25	75	100
				30	**21**		**175**	**525**	**700**
SEMESTER IV							CIA	Uni Exam	Total
21		Project	17P4CSPR8	20	20	Main Project	80	120	200
22	III	Core 10	17P4CS10	5	3	Distributed Operating system	25	75	100
23	III	Core 11	17P4CS11	5	3	Software project Management	25	75	100
				30	26		**130**	**270**	**400**
					90		**525**	**1575**	**2100**

SEMESTER – I

DESIGN AND ANALYSIS OF ALGORITHMS

Subject code: 17P1CS1

Unit I

Introduction - Definition of Algorithm – pseudo code conventions – recursive algorithms – time and space complexity –big-"oh" notation – practical complexities – randomized algorithms – Analysis of Binary Search, Factorial – Iteration & Recursion – Analysis

Unit II

Divide and Conquer: General Method - Finding maximum and minimum – Merge sort – Quick sort, Selection, Strassen's matrix multiplication – Greedy Method: General Method – knapsack problem - Tree vertex splitting - Job sequencing with deadlines.

Unit III

Dynamic Programming**:** General Method - multistage graphs – All pairs shortest paths – single source shortest paths – String Editing –Travelling salesman problem.

Unit IV

Back Tracking: General Method – 8-queens - Sum of subsets - Graph Coloring.

Branch and Bound: General Method - Travelling Salesperson problem.

Unit V

Graph Algorithms**:** Introduction – Breadth-First Search – Depth-First Search – Bi-connected component – Minimum Spanning Tree.

Text Books

(i) E. Horowitz, S. Sahni and S. Rajasekaran , Computer Algorithms,C++ version Galgotia, New Delhi.

(ii) S.K. Basu, 2008, Design Methods and Analysis of Algorithms, PHI, New Delhi.

References

(i) G. Brassard and P. Bratley, 1997, Fundamentals of Algorithms, PHI, New Delhi.

(ii) A.V. Aho, J.E. Hopcroft, J.D. Ullmann, 1974, The design and analysis of Computer Algorithms, Addison Wesley, Boston.

(iii) S.E.Goodman and S.T.Hedetniemi, 1977, Introduction to the Design and Analysis of algorithms, Tata McGraw Hill Int. Edn, New Delhi.

Advanced DBMS

Subject code: 17P1CS2

UNIT I

Overview of database systems: File Systems Versus a DBMS-Advantages of a DBMS-Describing and Storing Data in a DBMS- Queries in a DBMS-Transaction Management-Structure of a DBMS .Introduction to database design: Database Design and ER Diagrams-Entities, Attributes, and Entity Sets-Relationships and Relationship Sets-Additional Features of the ER Model-Conceptual Design With the ER Model-Conceptual Design for Large Enterprises-The Unified Modeling Language.

UNIT II

The Relational Model: Introduction to the Relational Model-Integrity Constraints over Relations- Enforcing Integrity Constraints-Querying Relational Data-Logical Database Design: ER to Relational-Introduction to views-Destroying/Altering Tables and Views. Relational algebra and calculus: Relational Algebra-Relational Calculus-Expressive Power of Algebra and Calculus.

UNIT III

Queries, Constraints, Triggers; Basic SQL Query- Union, Intersect, and Except- Nested queries-Aggregate operators-Null values - Complex Integrity Constraints in SQL -Triggers and Active Databases-Designing Active Databases. Database Application Development: Accessing databases from applications- Introduction to JDBC-JDBC Classes and Interfaces-SQLJ- Stored Procedures.

UNIT IV

Overview of Storage and Indexing: Data on External Storage-File Organizations and Indexing-Index Data Structures- Comparison of File Organizations-Indexes and Performance Tuning. Storing Data: Memory Hierarchy-Redundant Array of Independent Disks-Disk Space Management- Buffer Manager - Files of Records - Page Formats-Record

Formats.

UNIT V

Transaction Management: ACID Properties-Transactions and Schedules-Concurrent Execution of Transaction-Lock Based Concurrency Control. Concurrency Control: 2PL,Serializability and Recoverability- Introduction to Lock Management-Deadlocks- Locking Techniques-Concurrency Control without Locking.

TEXT BOOK

1. Raghu Ramakrishnan and Johannes Gehrke, "Database Management Systems", Tata McGraw-Hill Publishing Company, 2003.

REFERENCES

1. Abraham Silberschatz, Henry F. Korth and S. Sudarshan- "Database System Concepts", FifthEdition,McGraw-Hill,2006.

2. RamezElmasri and Shamkant B. Navathe, "Fundamental Database Systems", Third Edition, Pearson Education, 2003.

3. Hector Garcia–Molina, Jeffrey D.Ullman and Jennifer Widom- "Database System Implementation"- Pearson Education- 2000.

4. Narang,"Database Management Systems", 2nd ed., PHI.

Advanced JAVA Programming

Subject code: 17P1CS3

Unit I

JDBC Introduction – Establishing Connection – Creation, Insertion and Updation of Tables – Prepared Statement – Meta Data Function – Transactions – Result Sets – Stored Procedures.

Unit II

JApplet – Icons – Label – Text field – Button – Checkbox – Radio Button – Menu – Slider – Combo Box – Tabbed Pane – Scroll Pane – Tables.

Unit III

Inet Address – TCP/IP client sockets – TCP/IP server sockets – URL – URL Connection – Datagrams – Client / Server Application using RMI.

Unit IV

Bean Developing Kit – Jar Files – Introspection – Design Pattern for properties, events and methods – Constrained Properties – Persistence – Customizers.

Unit V

Life Cycle of a Servlet – Simple Servlet – Retrieving values of parameters and Initialization parameters – Cookies – Session Tracking.

Text Books

1. Herbert Schildt, JAVA 2 : The Complete Reference, Fourth Edition, Tata McGraw Hill, 2001.
2. "Advanced Java Programming", S.Gokila , Vijay Nicole Imprints, 2016.

Practical 1 : Advanced DBMS Lab -17P1CSPR1

1. To implement Data Definition language

1.1. Create, alter, drop, truncate

1.2. To implement Constraints.

1.2.1. (a). Primary key, (b).Foreign Key, (c). Check, (d). Unique, (e). Null,

(f). Not null , (g) . Default, (h). Enable Constraints, (i). Disable Constraints

(j). Drop Constraints

2. To implementation on DML, TCL and DRL

2.1. (a).Insert, (b).Select, (c).Update, (d).Delete, (e).commit, (f).rollback,

(g).save point, (i). Like'%', (j).Relational Operator.

3. To implement Nested Queries & Join Queries

3.1.(a). To implementation of Nested Queries

3.2.(b). (a) Inner join, (b).Left join, (c).Right join (d).Full join

4. Aggregate functions (a) SUM (b) AVG (c) MIN (d) MAX (e) COUNT

5. To implement Views (a). View, (b).joint view, (c).force view, (d). View with check option

6. Control Structure

6.1. To write a PL/SQL block for greatest of three numbers using IF AND ELSEIF

6.2. To write a PL/SQL block for summation of odd numbers using for LOOP

7. Procedures

7.1 To write a PL/SQL Procedure for Electricity bill preparation

7.2. To write a PL/SQL Procedure for GCD Numbers

8. Functions:

8.1. To write a PL/SQL block to implementation of factorial using function

8.2. To write a PL/SQL function to search an address from a bank account database

9. Cursors

9.1. To write a PL/SQL Procedure for student information system using cursor implementation

9.2. To write a PL/SQL Procedure for invoice bill preparation using cursor implementation

10. Trigger

10.1. To write a Trigger to pop-up the DML operations

10.2. To write a Trigger to check the age valid for data validation or not Using Message Alert.

10.3. Create a Trigger for Raise appropriate error code and error message.

10.4. Create a Trigger for a table it will update another table while inserting values

11. Design and implementation of Payroll processing System using database connectivity with front end tool VB

12. Design and implementation of Library Information System using database connectivity with front end tool VB

Practical 2: Advanced JAVA Programming Lab - 17P1CSPR2

1. Program using JDBC with database connectivity and Table creation, Insertion and Updation of data.

2. Program using JDBC with database connectivity with Prepared Statement, Transactions and Stored Procedures.

3. Program to demonstrate the use of Label, Text, Button, Check box, Radio button and Combo Box.

4. Program to demonstrate the use of Menu and Tab.

5. Program to implement client-server using Sockets.

6. Program to implement client-server using RMI.

7. Program to implement creation of Bean.

8. Program to create Servlet with database.

9. Program to count the number of visitors of a web page using Servlet.

10. Program to implement storing and retrieving of Cookies.

Elective I

Advanced Computer Architecture

Subject code: 17P1ECS1

UNIT I

General register organization- stack organization – Instruction formats – addressing modes – data transfer and manipulation – program control.

UNIT II

Parallel processing – pipelining – arithmetic pipeline – instruction pipeline - Vector processing- Array processors.

UNIT III

Addition and subtraction with signed magnitude – multiplication algorithms – floating point arithmetic operations – decimal arithmetic UNIT – decimal arithmetic operations.

UNIT IV

Input- output interface- Asynchronous data transfer – modes of transfer – priority interrupt – direct memory access – input – output processor – serial communication.

UNIT V

Main memory – auxiliary memory- associative memory- cache memory- virtual memory.

TEXT BOOKS

1. Computer System Architecture by M. Morris Mano – Prentice Hall India – Third Edition.

RERERENCES

1. Computer System Architecture and Parralel Processing by John P. Hayes – McGraw Hill Edition

2. Computer Organization by Hamachar, McGraw Hill Edition

3. Computer Architecture, Schaum outline series by Carter – Tata McGraw Hill Edition.

Elective I

SYSTEM SOFTWARE

Subject code: 17P1ECS1

UNIT I INTRODUCTION

System software and machine architecture – The Simplified Instructional Computer (SIC) - Machine architecture - Data and instruction formats - addressing modes - instruction sets - I/O and programming.

UNIT II ASSEMBLERS

Basic assembler functions - A simple SIC assembler – Assembler algorithm and data structures - Machine dependent assembler features - Instruction formats and addressing modes – Program relocation - Machine independent assembler features - Literals – Symbol-defining statements – Expressions - One pass assemblers and Multi pass assemblers - Implementation example - MASM assembler.

UNIT III LOADERS AND LINKERS

Basic loader functions - Design of an Absolute Loader – A Simple Bootstrap Loader - Machine dependent loader features - Relocation – Program Linking – Algorithm and Data Structures for Linking Loader - Machine-independent loader features - Automatic Library Search – Loader Options - Loader design options - Linkage Editors – Dynamic Linking – Bootstrap Loaders - Implementation example - MSDOS linker.

UNIT IV MACRO PROCESSORS

Basic macro processor functions - Macro Definition and Expansion – Macro Processor Algorithm and data structures - Machine-independent macro processor features - Concatenation of Macro Parameters – Generation of Unique Labels – Conditional Macro Expansion – Keyword Macro Parameters-Macro within Macro-Implementation example - MASM Macro Processor – ANSI C Macro language.

UNIT V SYSTEM SOFTWARE TOOLS

Text editors - Overview of the Editing Process - User Interface – Editor Structure. - Interactive debugging systems - Debugging functions and capabilities – Relationship with other parts of the system – User-Interface Criteria.

TEXT BOOK

1. Leland L. Beck, "System Software – An Introduction to Systems Programming", 3rd Edition, Pearson Education Asia, 2006.

REFERENCES

1. D. M. Dhamdhere, "Systems Programming and Operating Systems", Second Revised Edition, Tata McGraw-Hill, 2000.

2. John J. Donovan "Systems Programming", Tata McGraw-Hill Edition, 2000.

3. John R. Levine, Linkers & Loaders – Harcourt India Pvt. Ltd., Morgan Kaufmann Publishers, 2000.

Elective I

Digital Image Processing

Subject code: 17P1ECS1

UNIT I

Elements of digital image processing systems, Vidicon and Digital Camera working principles, Elements of visual perception, brightness, contrast, hue, saturation, mach band effect, Color image fundamentals - RGB, HSI models, Image sampling, Quantization, dither, Two-dimensional mathematical preliminaries, 2D transforms - DFT, DCT, KLT, SVD.

UNIT II

Histogram equalization and specification techniques, Noise distributions, Spatial averaging, Directional Smoothing, Median, Geometric mean, Harmonic mean, Contraharmonic mean filters, Homomorphic filtering, Color image enhancement.

UNIT III

Image Restoration - degradation model, Unconstrained restoration - Lagrange multiplier and Constrained restoration, Inverse filtering-removal of blur caused by uniform linear motion, Wiener filtering, Geometric transformations-spatial transformations.

UNIT IV

Edge detection, Edge linking via Hough transform – Thresholding - Region based segmentation – Region growing – Region splitting and Merging – Segmentation by morphological watersheds – basic concepts – Dam construction – Watershed segmentation algorithm.

UNIT V

Need for data compression, Huffman, Run Length Encoding, Shift codes, Arithmetic coding, Vector Quantization, Transform coding, JPEG standard, MPEG.

TEXTBOOKS

1. Rafael C. Gonzalez, Richard E. Woods, , Digital Image Processing', Pearson, Second Edition, 2004.

2. Anil K. Jain, , Fundamentals of Digital Image Processing', Pearson 2002.

REFERENCES

1. Kenneth R. Castleman, Digital Image Processing, Pearson, 2006.

2. Rafael C. Gonzalez, Richard E. Woods, Steven Eddins,' Digital Image Processing using MATLAB', Pearson Education, Inc., 2004.

3. D,E. Dudgeon and RM. Mersereau, , Multidimensional Digital Signal Processing', Prentice Hall Professional Technical Reference, 1990.

4. William K. Pratt, , Digital Image Processing' , John Wiley, New York, 2002

5. Milan Sonka et aI, 'IMAGE PROCESSING, ANALYSIS AND MACHINE VISION', Brookes/Cole, Vikas Publishing House, 2nd edition, 1999,

Formal Languages And Automata Theory

Subject code: 17P2CS4

UNIT 1:   [Covered by the Text book 1 and 2]

Fundamentals-String, Alphabets, Operations- Finite State Machine:- definitions, divisibility by the three tester, Regular sets, Regular Expression, limitations of FSM, Deterministic Finite Automata(DFA)- Non-Deterministic Finite Automata(NFA)-Transition Diagram.

UNIT II: [Covered by the Text book 1 and 2]

Finite Automata: NFA[Non-Deterministic Finite Automata] with Transition - Acception of languages, NFA to DFA conversion – minimization of state in DFA – Moore and Mealy Machine.

UNIT III: [Covered by the Text Book 3, Chapter 5 Pages 128 -150 and Covered by the Text book 1 , Chapter 5]

Grammar: Type of Grammar- Context-Free Grammars – Parse Trees - Constructing Parse Tree – Inference, Derivations- Inferences to Parse Tree – Trees to Derivations-Ambiguity Grammars-Removing Ambiguity from Grammars-Right linear and Left Linear Grammars. Context Free Grammar and Languages

UNIT IV: [Covered by the Text book 3 , Chapter 5, Pages 48 -60]

Turing Machine: Definition, Power of TM over FSM – Examples Turing machine -Design of Turning Machine for Checking Well Formed Parentheses- Unary addition -Multiplication of two numbers-Finding 1's complement- Recognizing Palindromes – Greatest Common Divisor and Recognizing 0n1n

UNIT V: [Covered by the Text book 1, Chapter 6]

Pushdown Automata: Definition-Graphical Notation -Languages of a PDA-Equivalence of PDA's and CFG's -Deterministic Pushdown Automata.

TEXT BOOKS

1. Theory of Automata, Formal Languages and Computation-John E. Hopcroft, Rajeev

Motwani, Jeffrey D.Ullman-Third Edition

2. Compilers Principles, Techniques, and Tools- Alfred V. Aho, Ravi Sethi , Jeffrey D.   Ullman-2nd Edition.

3. Theory of Computer Science – E.V.Krishnamoorthy, East-West Press, New Delhi 1989.

REFERENCES

1. Theory of Computer Science(Automata, Languages and Computation) by K.L.P. Mishra and N. Chandrasekaran, Second Edition, PHI Publication.

Object Oriented Analysis and Design & UML

subject code: 17P2CS5

UNIT I

Structured approach to system construction: SSADM/SADT - An overview of object oriented systems development & Life cycle

UNIT II

Various object oriented methodologies – Introduction to UML

UNIT III

Object oriented analysis – Use cases- Object classification, relationships, attributes, methods

UNIT IV

Object oriented design – Design axioms – Designing classes – Layering the software design: - data access layer, User interface layer, Control/business logic layer

UNIT V

UML - Examples on : Behavioral models – Structural models – Architectural models from real world problems.

TEXT BOOKS

1. **Bahrami Ali**, Object oriented systems development, Irwin McGrawHill, 2005 (First 4 UNITs covered here).

REFERENCES

2. Booch Grady, Rumbaugh James, Jacobson Ivar, The Unified modeling language – User Guide, Pearson education, 2006 (ISBN 81-7758-372-7)

Mobile Application Development

Subject code: 17P2CS6

Unit I

History of Embedded Device Programming - Open Handset Alliance - Introduction to Android - Features and Architecture of Android - Evolution of Android.

Unit II

Types of Android Applications - Android Design Philosophy - Android Development Tools - Building blocks of Android Application - Resources - Android Application Life Cycle - Android Activity Class.

Unit III

Fundamental Android User Interface design - Introducing Views - Layouts - Creating new Views - Menus.

Unit IV

Introducing Intents - Adapters - Using Internet Resources - Introducing Dialogs.

Unit V

Techniques for saving data - Saving and Loading Files - Databases in Android - Introducing Content Providers.

Text Books

1. Android : A Programmer's Guide, Jerome DiMarzio, Tata McGraw Hill, 2010.
2. Professional Android 4 Application Development, Reto Meier, Wiley-India, 2012.

References

1. Android for Programmers – An App-driven approach, Deitel et al., Prentice Hall, 2012.

2. Android Wireless Application Development, Shane Conder & Lauren Darcey, Addison-Wesley, 2nd Edition, 2010.

CASE TOOLS LAB

Subject code: 17P2CSPR3

Scope of this lab is to understand the application of case tools, which focuses on the following software engineering activities:

 • Software requirements analysis and specification

• Software design

• Software implementation

• Software testing and maintenance

 • Communication skills and teamwork

 • Modeling techniques and CASE tools

• Software project planning and management

Suggested List of Applications:

1. Student Marks Analyzing System

2. Quiz System

3. Online Ticket Reservation System

4. Payroll System

5. Course Registration System

6. Stock Maintenance

7. Library System

8. Telephone directory.

9. ATM Systems .

Android Application Lab

Subject code: 17P2CSPR4

1. Text View & Buttons
2. Radio Buttons
3. Alert Dialog
4. List
5. Forms
6. Date Picker
7. Text Formatting
8. Progress Bar
9. Writing & Reading a File
10. Menu

Elective II

Cryptography and Network Security

Subject code: 17P2ECS2

UNIT I:

Overview – Security Concepts – Security Attacks – Security Services - Symmetric Cipher Model – Substitution Techniques – Transposition Techniques.

UNIT II:

Block Cyber Principles – DES – Strength of DES – Principles of Public Key Cryptosystem – RSA Algorithm – Diffie Hellman Key Exchange.

UNIT III:

Wireless Network Security: Wireless Application Protocol Overview – Wireless Transport Layer Security - WAP End to End Security.

Email Security: Pretty Good Privacy – S/MIME.

UNIT IV:

IP Security: Overview – Policy- Encapsulating Security Payload – Combining Security Associations – Internet Key Exchange.

Intruders: Intruders – Detection- Password Management.

UNIT V:

Malicious Software: Types of Malicious Software – Viruses – Virus Countermeasures – Worms – Distributed Denial of Service Attacks.Firewalls: Need for Firewalls - Characteristics – Types of Firewalls – Firewall Basing – Firewall Locations and Configuration.

TEXT BOOK

1. Cryptography and network security – William Stallings.

2. Network security Essentials Applications and standards – William Stallings

1. Johannes A. Buchaman , Introduction to cryptography, Springer-Verlag.

2. Atulkahate , Cryptography and Network Security, TMH.

Elective II

Software Engineering

UNIT I

THE PRODUCT: The evolving role of software-Software. THE PROCESS: Software Engineering: A Layered Technology-The software process- Software process models-Linear sequential model-Prototyping model –RAD model-Evolutionary software process models-Component based development-Formal methods model-Fourth generation techniques.

UNIT II

SOFTWARE PROJECT PLANNING: Observation on estimating-Software scope-resources-Software project estimation-Decomposition techniques-Empirical estimation models-Make buy decision. PROJECT SCHEDULING AND TRACKING: Basic Concepts-Relationship between people and effort-Scheduling-Earned value analysis.

UNIT III

SYSTEM ENGINEERING: Computer based systems-The System engineering hierarchy-Business process engineering: overview-Product engineering: over view-Requirement engineering-System modeling. ANALYSIS CONCEPTS AND PRINCIPLES: Requirement Analysis-Requirement elicitation for software-Analysis principles-Software prototyping-Specification. ANALYSIS MODELING: The elements of the Analysis model-Data Modeling-Functional Modeling and information flow-Behavioral modeling-The mechanics of structured analysis-Data Dictionary.

UNIT IV

DESIGN CONCEPTS AND PRINCIPLES: Software design and software engineering-The design process-Design principles-Design concepts-Effective modular design-Design heuristics for effective modularity-Design Model-Design Documentation.

ARCHITECTURAL DESIGN: Software Architecture-Data design-Architectural styles-Mapping requirements into software architecture-Transform mapping-Transactional mapping-Refining architectural design. USER INTERFACE DESIGN: The Golden rules-User interface design-Task analysis and modeling-Interface design activities-Implementation tools-Design evaluation.

UNIT V

SOFTWARE TESTING TECHNIQUES: Software testing fundamentals-Test case design-white box testing basis path testing-Control structure testing-Black box testing-Testing for specialized environments, architectures and applications

SOFTWARE TESTING STRATEGIES:A strategic approach to software engineering-Strategic issues-unit testing-Integration Testing-Validation testing-System testing-The Art of debugging.

TEXT BOOK

1.Roger S.pressman,"Software Engineering.A Practitioners Approach",Sixth Edition,2005.

REFERENCES

1.C.Ghezzi,M.Jazayeri and D.Mandrioli,"Fundamentals of Software Engineering",Printice Hall of India Private Limited,2nd Endtion,2002.

2. Richard Farley,"Software Engineering Concepts",Tata McGraw Hill,2003.

3. I. Sommerville, 2001, Software Engineering, 6th Edition, Addison Wesley, Boston.

4. Rajib Mal, 2005, -Fundamental of Software engineering , 2nd Edition , PHI, New Delhi.

Elective II

ONTOLOGY ENGINEERING

Subject code: 17P2ECS2

UNIT I INTRODUCTION

Components – Types – Ontological Commitments – Ontological Categories – Philosophical Background - Knowledge Representation Ontologies – Top Level Ontologies – Linguistic Ontologies – Domain Ontologies – Semantic Web – Need –Foundation–Layers–Architecture.

UNIT II LANGUAGES FOR SEMANTIC WEB AND ONTOLOGIES

Web Documents in XML – RDF - Schema – Web Resource Description using RDF- RDF Properties – Topic Maps and RDF – Overview – Syntax Structure – Semantics – Pragmatics - Traditional Ontology Languages – LOOM- OKBC – OCML - Flogic Ontology Markup Languages – SHOE – OIL - DAML + OIL- OWL

UNIT III ONTOLOGY LEARNING FOR SEMANTIC WEB Taxonomy for Ontology Learning – Layered Approach – Phases of Ontology Learning –Importing and Processing Ontologies and Documents –Ontology Learning Algorithms-Evaluation

UNIT IV ONTOLOGY MANAGEMENT AND TOOLS

Overview – need for management – development process – target ontology – ontology mapping – skills management system – ontological class – constraints – issues. Evolution – Development of Tools and Tool Suites – Ontology Merge Tools – Ontology based Annotation Tools.

UNIT V APPLICATIONS

Web Services -Semantic Web Services-Case Study for Specific domain-Security issues-Current trends.

TEXTBOOKS

1. Asuncion Gomez-Perez, Oscar Corcho, Mariano Fernandez-Lopez, "Ontological Engineering: with examples from the areas of Knowledge Management, e-Commerce and the Semantic Web" Springer, 2004

2.Grigoris Antoniou, Frank van Harmelen, "A Semantic Web Primer (Cooperative Information Systems)", The MIT Press, 2004

REFERENCES

1. Alexander Maedche, "Ontology Learning for the Semantic Web", Springer; 1 edition, 2002

2. John Davies, Dieter Fensel, Frank Van Harmelen, "Towards the Semantic Web: Ontology – Driven Knowledge Management", John Wiley & Sons Ltd., 2003.

3. Dieter Fensel (Editor), Wolfgang Wahlster, Henry Lieberman, James Hendler, "Spinning the Semantic Web: Bringing the World Wide Web to Its Full Potential", The MIT Press, 2002

4. Michael C. Daconta, Leo J. Obrst, Kevin T. Smith, "The Semantic Web: A Guide to the Future of XML, Web Services, and Knowledge Management", Wiley, 2003

5. Steffen Staab (Editor), Rudi Studer, "Handbook on Ontologies (International Handbooks on Information Systems)", Springer 1st edition, 2004

Human Rights

Subject code: 17P2HR

UNIT I

Definition of Human Rights - Nature, Content, Legitimacy and Priority - Theories on Human Rights - Historical Development of Human Rights.

UNIT II

International Human Rights - Prescription and Enforcement upto World War II - Human Rights and the U .N .O. - Universal Declaration of Human Rights - International Covenant on Civil and Political Rights - International Convenant on Economic, Social and Cultural Rights and Optional Protocol.

UNIT III

Human Rights Declarations - U.N. Human Rights Declarations - U.N. Human Commissioner.

UNIT IV

Amnesty International - Human Rights and Helsinki Process - Regional Developments - European Human Rights System - African Human Rights System - International Human Rights in Domestic courts.

UNIT V

Contemporary Issues on Human Rights: Children's Rights - Women's Rights - Dalit's Rights - Bonded Labour and Wages - Refugees - Capital Punishment. Fundamental Rights in the Indian Constitution - Directive Principles of State Policy - Fundamental Duties - National Human Rights Commission.

TEXT BOOKS

1. International Bill of Human Rights, Amnesty International Publication, 1988.

2. Human Rights, Questions and Answers, UNESCO, 1982

3. Mausice Cranston - What is Human Rights

4. Desai, A.R. - Violation of Democratic Rights in India

5. Pandey - Constitutional Law.

6. Timm. R.W. - Working for Justice and Human Rights.

Open Source Technologies

Subject code: 17P3CS7

UNIT I

Introduction : Open Source – Open Source vs. Commercial Software – What is Linux? - Free Software – Linux Kernel.

UNIT II

Introduction: Linux Distributions – Download and Install - decisions, decisions - Linux partition Sizes - Accounts - Security – Basic Unix - Shell – Owner, groups, permissions, ownership Processes – PATH and Environment – Commands – Basic File system Essential – Useful Programs

UNIT III

Introduction - Apache - Starting, Stopping, and Restarting Apache - Modifying the Default Configuration - Securing Apache - Set User and Group - Allowing Access to Local Documentation - Creating Website - Apache control with .htaccess

UNIT IV

Introduction to MY SQL - Show Databases and Table - The USE command - Create Database and Tables - Describe Table - Select, Insert, Update, and Delete statement - Some Administrative detail - Table Joins - Loading and Dumping a Database.

UNIT V

PHP Introduction- Embedding PHP into HTML- Configuration – Language Syntax : Variables, Data Types , Operators , Flow Control – Built in PHP functions, Array, String functions - Database Access with PHP - MySQL - MySQL Functions - Inserting Records - Selecting Records - Deleting Records - Update Records.

TEXT BOOKS

"Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP", James Lee and Brent Ware, Dorling Kindersley(India) Pvt. Ltd, 2008.

REFERENCES

"Setting up LAMP: Getting Linux, Apache, MySQL, and PHP and working Together", Eric Rosebrock, Eric Filson, Published by John Wiley and Sons, 2004.

UNIX NETWORK PROGRAMMING

Subject Code: 17P3CS8

UNIT I

Overview of UNIX OS-File/O-File Descriptors –File Sharing- Files and directories-File types-File access permissions – File systems-Symbolic links-Standard I/O Library- Streams and file objects-Buffering-System data files and information-Password file- Group file-Login accounting-system identification.

UNIT II

Environment of a UNIX process - Process termination - command line arguments - Process control-Process identifiers-Process relationships terminal logins-Signals-threads.

UNIT III

Introduction   –Message   passing   (SVR4)-pipes-FIFO-message   queues-Synchronization (SVR4)-Mutexes-condition variables-read-write locks– file locking -record locking- semaphores-Shared memory(SVR4).

UNIT IV

Introduction –transport layer – socket introduction-TCP sockets-UDP sockets-raw sockets-Socket options-I/O multiplexing-Name and address conversions.

UNIT V

Application-Debugging techniques-TCP echo client server-UDP echo client server-Ping-Trace route- Client server applications like file transfer and chat.

TEXT BOOKS

1.W.Richard Stevens, Advanced programming in the UNIX environment,Addison Wesley,1999.(Unit1,2 &3)

2. W. Stevens, Bill Fenner, Andrew Rudoff, "Unix Network Programming",Volume 1.

3. TheSocketsNetworkingAPI,3rdEdition,Pearsoneducation,Nov2003.(unit4&5)

REFERENCES

1. Meeta Gandhi,Tilak Shetty and Rajiv Shah – The 'C' Odyssey Unix –The open BoundlessC,1stEdition,BPBPublications1992.

2. Stvens,"UnixNetworkProgramming:Inter process Communications",Vol 2,2nded., PHI.

3. Bill Fenner, "Unix Network Programming : The Sockets Networking", Vol 1, 3rd ed., Paperback, 2012.

4. Mark G.Sobell, "A Practical Guide to Linux Commands, Editors and Shell Programming", Paperback, 2012.

Principles of Compiler Design

Subject Code: 17P3CS9

UNIT I

Introduction to Compilers – Structure of Compiler, Lexical and Syntax, Intermediate code generation, Code optimization, Code generation, Book Keeping - Finite Automata and Lexical Analysis – Role of lexical analyzer , Regular expressions, Finite Automata, Language for Lexical analyzers - Syntactic Specification of Programming Languages – Context Free Grammar – Derivation and Parse Trees

UNIT II

Basic Parsing Techniques – Parsers – Shift reduce parser- Operator Precedence parsing – Top Down Parsing – Predictive Parser

UNIT III

Construction of Efficient Parsers – LR Parser – Canonical Collection of LR(0) items – Constructing SLR Parsing tables – Constructing canonical LR Parsing tables – Constructing LALR parsing tables

UNIT IV

Syntax - directed translation – Schemes of Translation – Implementation of Translators – Intermediate Code – Postfix notation – Parse Trees and Syntax trees – Three address code – Translation of Assignment statement – Boolean expressions – Statements to alter the flow of control -Symbol tables – Contents and Data structure of Symbol table

UNIT V

Code optimization – Introduction – Sources of optimization – Loop Optimization - Dominators – Reducible flow graphs – Depth-first search - Code generation – Object

Programs – Machine Model – Simple Code generator - Error detection and recovery –
Lexical , Syntactic and Semantic errors

TEXT BOOKS

1. A.V. Aho, J.D.Ullman, 1985, Principles of Compiler Design, Narosa Pub-House.

REFERENCES

1. D.Gries, 1979, Compiler Construction for Digital Computers, John Wiley & Sons.
2**.** A.V.Aho, Ravi Sethi, and J.D.Ullman, 1986, Compilers Principles, Techniques and
Tools, Addison Wesley Pub. Co.

Open Source Technology Lab

Subject Code: 17P3CSPR5

1. Write a PHP program to process the marks obtained by students and embed it in HTML. Use the Multi-Dimensional array concept.

2. Write a PHP program for database management.

3. Write a PHP program for cookies and sessions.

4, Write a PHP program for creating a simple site in IIS/Apache/WAMP

5. Write a Shell Script using string, yacc and grep

6. Write a Shell Script using Looping and Control Structures.

7. Develop program for student mark processing using MYSQL

8. Develop program for Invoice Bill Preparation using MYSQL

9. Develop program for Online shopping

10. Develop a program for uploading a site with search form

UNIX NETWORK PROGRAMMING LAB

Subject Code: 17P3CSPR6

1. Write a shell script to copy, rename and print multiple files using choice menus.

2. Write a shell script to display logged in users who are using high CPU percentage.

3. Write a shell script to list processes based on CPU percentage and memory un usage.

4. Writea shell script to display total used and free memory space.

5. Write a shell script that takes as command-line input a number n and a word.The program should then print the word n times, one word per line.

6. Write a shell scripts using the following statements.
   a) While-loop
   b) For-loop
   c) If-
   then-
   else
    d)
   Switch

7. Write a shell script using grep statement.

8. Write a shell script that can search all immediate sub-directories of the current-directory for a given file and then quit if it finds one.

9. Write a shell script program to include verbose Debug option for debugging.

10. Write a shell script program to include xtrace Debug option for debugging.

<div align="center">

Elective III

Cloud Computing

</div>

Subject Code:17P3ECS3

UNIT I

Grid Computing – Introduction – Early Grid Activities – Overview of Grid Business Areas –Grid Applications – Grid Infrastructure- Grid Computing Organizations their Roles – Grid computing Anatomy.

UNIT II

Cloud computing – History of Cloud Computing – Cloud Architecture – Cloud Storage – Why cloud computing Matters – Advantages of Cloud computing – Disadvantages of Cloud Computing – Companies in the Cloud Today – Cloud Services.

UNIT III

Web-Based Application – Pros and Cons of Cloud Service Development – Types of Cloud Service Development – Software as a Service – Platform as a Service – Web Services – On-Demand computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2- Google App Engine – IBM Clouds.

UNIT IV

Centralizing Email communications – collaborating on Schedules – Collaborating on To-Do Lists – Collaborating Contact Lists – Cloud computing for the Community – Collaborating on Group Projects and Events – Cloud Computing for the Corporation.

UNIT V

Collaborating on Calendars, Schedules and Task Management – Exploring Online Scheduling Applications – Exploring Online Planning and Task Management – Collaborating on Event Management – Collaborating on Contact Management –

Collaborating on Project Management – Collaborating on Databases – Storing and Sharing Files – Evaluating Web Mail Services .

TEXT BOOKS

1. Joshy Joseph &CriagFellenstein, "Grid Computing", PHI, PTR, 2003.
2. Michael Miller, Cloud Computing : Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, August 2008.

REFERENCES

1. Haley Bear, Cloud Computing Best Practices for Managing and Measuring Processes

for On-demand Computing, Applications and Data Centers in the Cloud with SLAs.

SOFT COMPUTING

Subject Code: 17P3ECS3

UNIT I

Artificial neural network: Introduction, characteristics- learning methods – taxonomy – Evolution of neural networks- basic models – important technologies – applications. Fuzzy logic: Introduction – crisp sets- fuzzy sets – crisp relations and fuzzy relations: cartesian product of relation – classical relation, fuzzy relations, tolerance and equivalence relations, non-iterative fuzzy sets. Genetic algorithm- Introduction – biological background – traditional optimization and search techniques – Genetic basic concepts.

UNIT II   NEURAL NETWORKS

McCulloch-Pitts neuron – linear separability – hebb network – supervised learning network: perceptron networks – adaptive linear neuron, multiple adaptive linear neuron, BPN, RBF, TDNN- associative memory network: auto-associative memory network, hetero-associative memory network, BAM, hopfield networks, iterative autoassociative memory network & iterative associative memory network – unsupervised learning networks: Kohonen self organizing feature maps, LVQ – CP networks, ART network.

UNIT III   FUZZY LOGIC

Membership functions: features, fuzzification, methods of membership value assignments- Defuzzification: lambda cuts – methods – fuzzy arithmetic and fuzzy measures: fuzzy arithmetic – extension principle – fuzzy measures – measures of fuzziness -fuzzy integrals – fuzzy rule base and approximate reasoning : truth values and tables, fuzzy propositions, formation of rules-decomposition of rules, aggregation of

fuzzy rules, fuzzy reasoning-fuzzy inference systems-overview of fuzzy expert system-fuzzy decision making.

UNIT IV   GENETIC ALGORITHM

Genetic algorithm and search space – general genetic algorithm – operators – Generational cycle – stopping condition – constraints – classification genetic programming – multilevel optimization – real life problem- advances in GA.

UNIT V   HYBRID SOFT COMPUTING TECHNIQUES & APPLICATIONS

Neuro-fuzzy hybrid systems – genetic neuro hybrid systems – genetic fuzzy hybrid and fuzzy genetic hybrid systems – simplified fuzzy ARTMAP – Applications: A fusion approach of multispectral images with SAR, optimization of traveling salesman problem using genetic algorithm approach, soft computing based hybrid fuzzy controllers.

TEXT BOOKS

1. J.S.R.Jang, C.T. Sun and E.Mizutani, "Neuro-Fuzzy and Soft Computing", PHI / Pearson Education   2004.
2. S.N.Sivanandam and S.N.Deepa, "Principles of Soft Computing", Wiley India Pvt Ltd, 2011.

REFERENCES

1. S.Rajasekaran and G.A.Vijayalakshmi Pai, "Neural Networks, Fuzzy Logic and Genetic Algorithm: Synthesis & Applications", Prentice-Hall of India Pvt. Ltd., 2006.
2. George J. Klir, Ute St. Clair, Bo Yuan, "Fuzzy Set Theory: Foundations and Applications" Prentice Hall,1997.

3. David E. Goldberg, "Genetic Algorithm in Search Optimization and Machine Learning" Pearson Education India ,2013.

4. James A. Freeman, David M. Skapura, "Neural Networks Algorithms, Applications, and Programming Techniques, Pearson Education India, 1991.

5. Simon Haykin, "Neural Networks Comprehensive Foundation" Second Edition, Pearson Education, 2005.

Elective III

Data Mining and Warehousing

Subject Code: 17P3ECS3

UNIT I

Introduction to Data Mining – Association Rule Mining- Basics- Task and Naïve Algorithm- The Apiori Algorithm- Direct Hashing and Pruning(DHP).

UNIT II

Classification – Introduction – Decision Tree – Tree Induction Algorithm – Split Algorithm Based on Information Theory – Decision Tree Rules – Naïve Bayes Method.

UNIT III

Cluster Analysis- Introduction – Desired features of clustered Analysis -Types of Data- Computing distance – Types of Cluster analysis Methods – Partitional Method – Hierarchical Methods.

UNIT IV

Web Data Mining – Introduction – Web Technology and characteristics – Locality and Hierarchy in the web – Web content mining – Web Usage Mining – Web mining software.

UNIT V

Data Warehousing – Introduction – Operational Data stored – Data warehouses – Warehouse Design – OLAP – Characteristics of OLAP systems – Multidimensional View and Data Cube.

TEXT BOOK

G.K.Gupta, Introduction to Data mining with case studies ,Prentice Hall India , 2006 (ISBN 81-203-3053-6)

REFERENCES

1. K.P.Soman&ShyamDiwakar and V. Ajay, Insight to Data Mining Theory and Practice, Prentice Hall of India, 2006. (ISBN -81-203- 2897-3)

2. Jiawei Han and MichelineKamber, Data Mining Concepts and Techniques, Elsevier, Second Edition, 2007 (ISBN: 81-312-0535-5

Project Dissertation & Viva Voce

Subject Code : 17P4CSPR8

Regulations of Project Work

- Students should do their project work in a company/institutions for 5 Months
- The Candidate should submit the filled format given, to the department for approval during the 1st week of January in their project semester
- Each internal guide shall have maximum of 5 candidates
- Periodical review of the project work is to be done for at least 3 reviews
- The students should prepare three copies of the dissertation and submit the same to the college on 30th April for the evaluation by examiners. After evaluation one copy is to be retained in the department library and one copy is to be submitted to the college and the student can hold one copy.

DISTRIBUTED OPERATING SYSTEMS

Subject Code : 17P4CS10

UNIT - I

Evolution –Models – Popularity - Distributed Operating System – Issues – Distributed Computed Environment - Features of a Good Message Passing – Issues- Synchronization – Buffering - – Multidatagram Messages – Encoding and Decoding of Message Data – Process Addressing – Failure Handling – Group Communication.

UNIT II

The RPC Model –Transparency – Implementation – Stub – Messages – Marshaling - Server Management –Parameter Passing Semantics – Call Semantics – Communication protocols – Complicated – Client server Binding – Exception Handling – Security – Special types – Heterogeneous – Light Weight – Optimization

UNIT III

Clock Synchronization – EventOrdering – Mutual Exclusion – Deadlock – Election Algorithms - Process Migration – Threads.

UNIT IV

Meet Hadoop: Data - Data Storage and Analysis - Comparison with Other Systems - A Brief History of Hadoop - The Apache Hadoop Project – MapReduce: A Weather Dataset - Analyzing the Data with Unix Tools - Analyzing the Data with Hadoop - Scaling Out - Hadoop Streaming - Hadoop Pipes

UNIT V

The Configuration API - Configuring the Development Environment - Running Locally on Test Data - Running on a Cluster - The MapReduce Web UI - Using a Remote Debugger - Tuning a Job - MapReduce Workflows

TEXT BOOK

1. Pradeep K. Sinha, "Distributed Operating System Concepts and Design ", PHI, New Delhi, 2007.
2. ,"Hadoop: The Definitive Guide", Published by O'Reilly Media, Third Edition, 2009.

REFERENCES

1. H.M. Deitel, 1990, An Introduction to Operating Systems, Addison Wesley Publishing Co., Boston

2. D.M. Dhamdhare , 2002, Operating System, Tata McGraw-Hill, New Delhi. 3. A.S. Tanenbaum , Operating Systems: Design and Implementation, Prentice-Hall of India, New Delhi.

SOFTWARE PROJECT MANAGEMENT

Subject Code:17P4CS11

Unit I

Introduction to software management: Introduction- why is SPM important? –Project-Software project Vs other type of project – Contract and technical project management – Activities- plan, methods And methodologies – categorizing software projects – stakeholders – Setting objectives – Business case – project success and failures – Managements.

Project Evaluation and Programme Management: Introduction-Business case- Project portfolio management- Evaluation of individual Projects-Cost benefit Evaluation Techniques - Risk Evaluation - Programme Management – managing the allocation of resources – Strategic programme management – Creating a programme and aids – Benefits management.

Unit II

Overview of Project Planning: Introduction- Stepwise Project Planning- steps. Selection of An Appropriate Project Approach: Introduction-Build or buy- Choosing methodologies and technologies-- software Processes and models-choice of Process models- Structure Vs speed of delivery – Waterfall model - spiral model – software prototyping - Rapid application development – Agile methods- Extreme programming.

Unit III

Software Effort Estimation: Introduction-Where are estimates done? – Problems with over and under estimates – Basis for estimating and its Techniques – Bottom up estimating-Top down approach and parametric models- Expert judgment-Estimating by analogy Function point analysis-FP markII- COSMIC full FP-COCOMO II-cost estimation and staffing patterns.

Activity Planning: Introduction-objectives-when to plan?-project schedules-Projects activities-network Planning models-sequencing and scheduling activities-Formulating a network model-Adding the time dimension-Forward and backward Pass- critical Path-activity Float- Shortening the project duration-critical activities- Activity on arrow network.

Unit IV

Risk management: Introduction-Risk-Categories of Risk-a framework for dealing with risk-Risk identification-Risk assessment-Risk planning-Risk Management-Evaluating Risk to Schedule-Applying the PERT Technique-Monte-Carlo Simulation-Critical Chain Concepts.

Unit V

Monitoring and Control: Introduction-Creating the framework-collecting the data-Review-Software Configuration Management. Managing Contracts: Introduction-Types of Contracts-Contract Management- Managing People in software environments

TEXT BOOK

"Software Project Management" – Bob Hughes, Mike Cotterell and Rajib Mall- Fifth Edition

REFERENCES

1. Ramesh, Gopalaswamy, "Managing Global Projects", Tata McGraw Hill, 2001.
2. Royce, "Software Project Management", Pearson Education, 1999.
3. Jalote, "Software Project Management in Practice", Pearson Education, 2002.

PG & Research Department of Computer Science

Regulations of M.Phil. in Computer Science
(Effective from the academic year 2017-18)
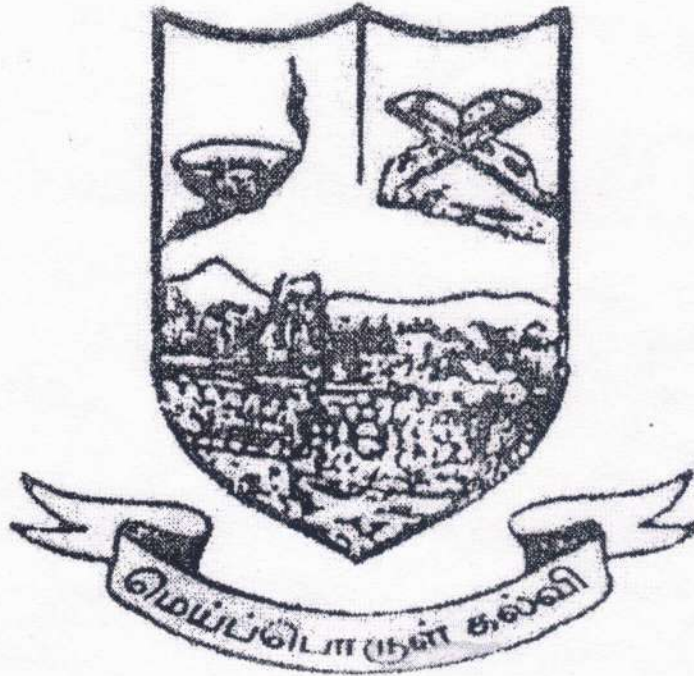
Muthurangam Govt. Arts College (Autonomous)
Otteri, Vellore – 2.
(Affiliated to Thiruvalluvar University)

Muthurangam Government Arts College(Autonomous) Vellore -2

2017-2019

Board of Studies in M.Phil Computer Science (PG)

Members

S. No	Members		Name
1.	Chairman - Head of the Department	1.	**Prof. I Anette Regina ,** Associate Professor
2.	Entire Faculty (Include all faculty)	1.	**Prof. A M Saravanan** Assistant Professor
		2.	**Prof. T. K Ganga** Assistant Professor
		3.	**Prof. S. Geetha** Assistant Professor
		4	**Prof. R. Viswanathan** Assistant Professor
3.	Experts from Outside	1.	**Prof. A George Louis Raja** Assistant Professor Department of MCA Sacred Heart College Tirupathur
		2.	**Ms. S. Uma,** Assistant Professor **TVUCAS, Tirupattur.**
4.	University Nominee	1.	**Prof. P. Magizhan** Associate Professor Islamiah College, Vaniyambadi – 635 752
5.	Industry Representative	1.	Mr. Senthil Kumar
6.	Alumni	1.	Mrs. M. Priya

Regulations

1. **Eligibility :**

   A candidate who has passed the M.Sc. Degree Examination in Computer Science or Computer Science and Technology or M.C.A. of this University or an Examination of any other University accepted by the Syndicate as equivalent thereto shall be permitted.

2. **Duration of the Programme :**

   The minimum duration for completion of M.Phil. in a discipline is two semesters and the maximum duration is four semesters.

3. **Structure of the Program :**

Course	Sub. Code	Title of the Paper	Cr.	Exam Hrs.	Max. Marks		
					CIA	Sem. Exam	Total
I Semester							
Core		Research Methodology	5	3	25	75	100
Core		Advanced Research Areas in Computer Science	5	3	25	75	100
Elective		Artificial Neural Network (or) Cryptography and Network Security (or) Ad-Hoc and Sensor Networks	5	3	25	75	100
II Semester							
Core		Dissertation and Viva-voce	21	-	50	150	200
			36				500

4. **Question paper pattern :**

   Section A (5*6 = 30 marks) either or type, One question from each Unit.
   Section B (3*15 = 45 marks) Three out of Five, One question from each Unit

5. **Evaluation of Dissertation :**

The dissertation shall be jointly valued by the supervisor and one external examiner. The viva-voce examination on the dissertation shall be jointly conducted by the supervisor and the external examiner. The distribution of marks shall be as under:
· 20% marks for Periodical presentation (to be evaluated and awarded by the supervisor)
· 60% marks for the Dissertation
· 20% marks for Viva-voce

Candidates must participate in two National / International Conferences and they are advised to publish research papers in atleast two National / International Conferences during the course period.

6. **CIA Components :**

Internal Tests	-	15 Marks
Teaching Skills	-	5 Marks
Paper Work	-	5 Marks

7. **Submission of Dissertation :**

The last date for submission of Dissertation shall be 31st August every year without penalty. Those who do not submit the dissertation in time may be given an extension of a maximum of two months with a penal fee prescribed by the University (i.e. up to 31st October). There shall be no further extension of time beyond this period. Any student failing to submit the dissertation within this period will be permitted to submit the dissertation only in the next academic year along with the subsequent batch of students.

8. **Passing Minimum :**

a) A candidate shall be declared to have passed the whole examination, if the candidate passes in all the theory papers and dissertation wherever prescribed as per the scheme of examinations.

b) A candidate should get not less than 50% in the Semester Examination, compulsorily, in all papers, including Dissertation. Also the candidate who secures not less than 50% marks in the external as well as internal (CIA) examinations put together in any paper / dissertation shall be declared to have successfully passed the examination. There shall be no passing minimum for the CIA. The candidate who absents himself for CIA programmes, even after a repeated chance, will be awarded zero mark in the concerned subject.

CORE I ::: RESEARCH METHODOLOGY

UNIT I

Overview of Research Methodology : Introduction, Types of Research, Research Process. Data Collection and Presentation : Primary Data, Secondary Data, Data Presenation. Basic Statistical Measures : Measures of Central Tendency, Measures of Variation, Measures of Skewness.

UNIT II

Design and Analysis of Experiments : Introduction, ANOVA, Completely randomized design, Latin Square design, Duncan's Multiple range test, Factorial Design, 2^n Factorial Experiment. Probability Distributions : Binomial, Poisson, Uniform, Exponential, Normal Distributions.

UNIT III

Sampling Methods and Distribution – Tests of Hypotheses : Introduction, Tests of Hypotheses concerning Mean, Test of Hypotheses concerning proportion, variance, Chi-square test, Goodness of fit. One Sample test, Two-sample test, K-sample Tests.

UNIT IV

Multivariate Analysis : Correlation Analysis, Forecasting, Linear Regression and Time Series. Advanced Multivariate Analysis : Discriminant Analysis, Factor Analysis and Methods, Cluster Analysis.

UNIT V

Report Writing : Types of Report, Guidelines for Reviewing Draft, Report Format, Typing Instructions, Oral Presentation. **Introduction to MAT Lab** – Common System Commands and Mathematical Operators – Handling Arrays and Matrices – Programming in MAT Lab, M_File scripts & Functions.

Text Books
1. Research Methodology, R. Pannerselvam, PHI, New Delhi, 2005.
2. MAT Lab Programming, Y. Kirani Singh & B.B. Chaudhuari, PHI, 2008.

Reference Books
1. Bendat and Piersol, Random data: Analysis and Measurement Procedures, Wiley Interscience, 2001.
2. Richard I Levin amp; David S.Rubin, Statistics for Management, 7/e. Pearson Education, 2005.
3. Donald R. Cooper, Pamela S. Schindler, Business Research Methods, 8/e, Tata McGraw-Hill Co. Ltd., 2006.

4. Thesis & Assignment Writing, Anderson, Benry H. Dujyston, H.Pode, Wiley Eastern LTd., New Delhi, 1970.

CORE II ::: ADVANCED RESEARCH AREAS IN COMPUTER SCIENCE

UNIT I

Introduction - Data Preprocessing – Data Warehousing and Online Analytical Processing – Data Cube Technology.

UNIT II

Mining Frequent Patterns, Associations and Correlations – Advanced Pattern Mining-Classification : Advanced Concepts & Methods.

UNIT III

Introduction : Cloud Computing at a Glance, Historical Developments, Building Cloud Computing Environments, Computing Platforms and Technologies. **Principles of Parallel and Distributed Computing :** Eras of Computing, Parallel Vs Distributed Computing, Elements of Parallel and Distributed Computing, Technologies for Distributed Computing.

UNIT IV

Virtualization : Introduction, Characteristics, Taxonomy of Virtualization Techniques, Virtualization and Cloud Computing, Pros and Cons of Virtualization, Technology Example.

Unit V

Analytics – Nuances of big data – Value – Issues – Case for Big data – Big data options Team challenge – Big data sources – Acquisition – Nuts and Bolts of Big data. Features of Big Data - Security, Compliance, auditing and protection - Evolution of Big data – Best Practices for Big Data Analytics - Big data characteristics - Volume, Veracity, Velocity, Variety – Data Appliance and Integration tools.

Text Book

1. Han Kamber Pei, **"Data Mining Concepts and techniques"**, 3rd Edition, Morgan Kaufmann Publishers, 2011.
2. Rajkumar Buyya, Christian Vecchiola and S. Thamarai Selvi, **"Mastering Cloud Computing",** MGH New Delhi, 2013.
3. Frank J Ohlhorst, "Big Data Analytics: Turning Big Data into Big Money", Wiley and SAS Business Series, 2012.

References
1. Mehmed kantardzic,"Datamining concepts,models, methods, and algorithms", Wiley Interscience, 2003.

2. Michael Miller, "Cloud Computing", Pearson Education, 2012.
3. Borko Furht and Armando J. Escalante, "Hand Book of Cloud Computing", Springer, 2010.

ELECTIVE ::: ARTIFICIAL NEURAL NETWORK

UNIT I -

Introduction- Background- Knowledge Based Information Processing- Neural Information Processing-Hybrid Intelligence. Basic Concepts Of Neural Networks- Inference And Learning-Classification Models-Association Models-Optimization Models- Self Organisational Models-Hardware Implementation.

UNIT II

Introduction- Supervised and Unsupervised Learning-Statistical Learning- AI Learning- Neural Network Learning-Genetic Algorithms.

UNIT III

Introduction-Rule Based Neural Networks-Network Training-Network Revision- Example of Theory Revision- Decision Tree-Based Neural Networks –Constraint-Based Neural Networks

UNIT IV

Introduction-Fundamental Principles-Symbolic Methods-Neural network Approaches-The Incremental RBCN

UNIT V

Introduction- Mathematical Modeling In General- The Application Of Neural Networks-Neural Networks As Mathematical Models-Knowledge Based Approaches.

Text Book

LiMin Fu, **"Neural Networks in Computer Intelligence"**, TMGH LTd., 2011.

References

1. Haykin S., Neural Networks : A Comprehensive Foundation, Pearson Education Inc., Second Edition, 2003.
2. Freeman J.A., Skapura D.M., Neural Network Algorithms, Applications and Programming Techniques, Addison-Wesley Publications, 1992.

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ELECTIVE ::: CRYPTOGRAPHY AND NETWORK SECURITY

UNIT I

Block Ciphers and the Data Encryption Standard : Block Ciphers Principles – The Data Encryption Standard(DES) –A DES Examples- The Strength Of DES- Differential And Linear Cryptanalysis- Block Cipher Design Principles

UNIT II

Public Key Cryptography and RSA : Principles Of Public-Key Cryptosystems - The RSA Algorithm- **Other Public Key Cryptosystems :** Diffie- Hellman Key Exchange- Elgamel Cryptographic System – Elliptic Curve Arithmetic – Elliptic Curve Cryptography- Pseudorandom Number Generation Based On A Asymmetric Cipher

UNIT III

Cryptographic Hash Functions : Applications Of Cryptographic Hash Functions- Two Simple Hash Functions- Requirements And Security- Hash Functions Based On Cipher Block Chaining- Secure Hash Algorithm (SHA)

UNIT IV

User Authentication : Remote User Authentication Principles- Remote User Authentication Using Symmetric Encryption-Kerberos- Remote User Authentication Using Asymmetric Encryption – Federated Identity Management. **Electronic Mail Security :** Pretty Good Privacy- S/MIME-Domain Keys Identified Mails

UNIT V

IP Security : IP Security Overview – IP Security Policy – Encapsulating Security Payload- Combining Security Associations – Internet Key Exchange – Cryptographic Suites –**Firewalls :** The Need For Firewalls- Firewall Characteristics – Types Of Firewalls- Firewall Basing- Firewall Locations And Configurations

Text Book

"**Cryptography and Network Security**", 5th Edition, William Stallings, Pearson Education, 2011.

References

1. Johannes A. Buchaman , Introduction to cryptography, Springer-Verlag.
2. Atul kahate , Cryptography and Network Security, TMH

ELECTIVE ::: AD-HOC AND SENSOR NETWORKS

UNIT I

Introduction – Issues in Ad-Hoc Wireless Networks. MAC Protocols – Issues, Classifications of MAC protocols, Multi channel MAC & Power control MAC protocol.

UNIT II

Issues – Classifications of routing protocols – Table-Driven, On-Demand, Hybrid, Flooding, Hierarchical and Power aware Routing Protocols.

UNIT III

Multicast routing – Classifications, Tree based, Mesh based, Ad Hoc Transport Layer Issues, TCP Over Ad Hoc – Feedback based, TCP with explicit link, TCP-BuS, Ad Hoc TCP, and Split TCP.

UNIT IV

QoS in Ad-Hoc Wireless network- Introduction, Issues and Challenges, Classification of QoS Solution, MAC layer solutions, Network Layer Solutions, QOS Framework for Ad-Hoc Network, Energy Management in Ad-Hoc Wireless Network - Energy Management in Ad Hoc Wireless Network

UNIT V

Introduction – Sensor Network Architecture, Data dissemination, Gathering, MAC Protocols, Localization – Indoor and Sensor Network Localization, QoS in WSN.

REFERENCES:

1. C.Siva Ram Murthy and B.S. Manoj, " Ad Hoc Wireless Networks – Architectures and Protocols", Pearson Education, 2004.
2. Feng Zhao and Leonidas Guibas, "Wireless Sensor Networks", Morgan Kaufman Publishers, 2004.
3. C.K.Toh, "Ad Hoc Mobile Wireless Networks", Pearson Education, 2002.
4. Thomas Krag and Sebastin Buettrich, "Wireless Mesh Networking", O'Reilly Publishers, 2007.

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Internet of Things

UNIT I

Introduction – Characteristics – Physical design - Protocols – Logical design – Enabling technologies – IoT Levels – Domain Specific IoTs – IoT vs M2M.

UNIT II

IoT systems management – IoT Design Methodology – Specifications Integration and Application Development.

UNIT III

Physical device – Raspberry Pi Interfaces – Programming – APIs / Packages – Web services.

UNIT IV

Intel Galileo Gen2 with Arduino- Interfaces - Arduino IDE – Programming - APIs and Hacks.

UNIT V

Various Real time applications of IoT- Connecting IoT to cloud – Cloud Storage for Iot – Data Analytics for IoT – Software & Management Tools for IoT.

REFERENCES:

1. Arshdeep Bahga, Vijay Madisetti, "Internet of Things – A hands-on approach", Universities Press, 2015.
2. Manoel Carlos Ramon, "Intel® Galileo and Intel® Galileo Gen 2: API Features and Arduino Projects for Linux Programmers", Apress, 2014.
3. Marco Schwartz, "Internet of Things with the Arduino Yun", Packt Publishing, 2014.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS)
VELLORE-2
BACHELOR OF SCIENCE
B.Sc., ZOOLOGY
DEGREE COURSE CBCS PATTERN (With. Effect from 2017-2018)
The Course of Study and the Scheme of Examination:

S. No.	Part	Study Components / Course Title		Ins. Hrs./ Week	Credit	Title of the Paper	Maximum Marks		
							CIA	Uni. Exam	Total
SEMESTER I									
1	I	Language	Paper-1	6	3	Tamil/Other Languages	25	75	100
2	II	English	Paper-1	6	3	English	25	75	100
3	III	Core Theory	Paper-1	6	6	Invertebrata	25	75	100
	III	Core Practical	Practical-I	3	0	Invertebrata and Chordata	0	0	0
4	III	Allied-1	Paper-1	4	4	Chemistry-1	25	75	100
	III	Allied Practical	Practical-I	3	0	Chemistry	0	0	0
5	IV	Environmental Studies		2	2	Environmental Studies	25	75	100
				30	18		125	375	500
SEMESTER II									
6	I	Language	Paper-2	6	3	Tamil/Other languages	25	75	100
7	II	English	Paper-2	4	2	English	25	75	100
8	III	Core Theory	Paper-2	6	6	Chordata	25	75	100
9	III	Core Practical	Practical-I	3	3	Invertebrata and Chordata	40	60	100
10	III	Allied-1	Paper-2	4	4	Chemistry –II	25	75	100
11	III	Allied Practical	Practical-I	3	2	Chemistry	40	60	100
12	IV	Value Education		2	2	Value Education	25	75	100
13	IV	Soft Skills		2	1	Soft Skills	40	60	100
				30	23		245	555	800
SEMESTER III									
14	I	Language	Paper-3	6	3	Tamil / Other Languages	25	75	100
15	II	English	Paper-3	6	3	English	25	75	100
16	III	Core Theory	Paper-3	3	3	Cell and Molecular Biology	25	75	100
	III	Core Practical	Practical II	3	0	Cell & Molecular Biology & Genetics	0	0	0
17	III	Allied-2	Paper-3	4	4	Economic Entomology & Pest Management-I	25	75	100
	III	Allied Practical	Practical-II	3	0	Economic Entomology & Pest Management-I	0	0	0
18	IV	Skill Based Subject - I	Paper-1	3	3	Public Health and Hygiene	25	75	100
19	IV	Non-Major Elective - I	Paper-1	2	2	Vermiculture	25	75	100
				30	18		150	450	600
SEMESTER IV									
20	I	Language	Paper-4	6	3	Tamil/Other Languages	25	75	100
21	II	English	Paper-4	6	3	English	25	75	100
22	III	Core Theory	Paper-4	3	3	Genetics	25	75	100
23	III	Core Practical	Practical-II	3	3	Cell and Molecular Biology& Genetics	40	60	100
24	III	Allied-2	Paper-4	4	4	Economic Entomology And Pest Management-II	25	75	100
25	III	Allied Practical-II	Practical-II	3	3	Economic Entomology & Pest Management	40	60	100
26	IV	Skill Based Subject – II	Paper-2	3	3	Apiculture	25	75	100
27	IV	Non-Major Elective - II	Paper-2	2	2	Sericulture	25	75	100
				30	24		230	570	800

		SEMESTER V					**CIA**	**Uni. Exam**	**Total**
28	III	Core Theory	Paper-5	6	6	Biotechnology, Biostatistics & Bioinformatics	25	75	100
29	III	Core Theory	Paper-6	5	5	Developmental Biology and Immunology	25	75	100
30	III	Core Theory	Paper-7	5	5	Animal Physiology	25	75	100
	III	Core Practical	Practical-III	3	0	Animal Physiology Dev. Biology and Immunology	0	0	0
	III	Core Practical	Practical-IV	3	0	Env. Biology & Economic Zoology & Biotechnology	0	0	0
31	III	Elective I	Paper-1	5	5	Medical Lab Techniques	25	75	100
32	IV	Skill Based Subject III	Paper-3	3	3	Pisciculture	25	75	100
				30	**24**		**125**	**375**	**500**
		SEMESTER VI							
33	III	Core Theory	Paper-8	5	5	Environmental Biology	25	75	100
34	III	Core Theory	Paper-9	5	5	Economic Zoology	25	75	100
35	III	Core Theory	Paper-10	5	5	Evolution	25	75	100
36	III	Core Practical	Practical-III	3	4	Animal Physiology, Developmental Biology & Immunology	40	60	100
37	III	Core Practical	Practical-IV	3	4	Environmental Biology & Economic Zoology & Biotechnology	40	60	100
38	III	Elective – II	Paper-2	3	3	Bio-Instrumentation	25	75	100
39	III	Elective – III	Paper-3	3	3	Microbiology	25	75	100
40	IV	Skill Based Subject - IV	Paper-4	3	3	Poultry Farming	25	75	100
41	V	Extension Activities		0	1		10	40	50
		TOTAL		**30**	**33**		**240**	**610**	**850**

Part	Subject	Papers	Credit	Total Credits	Marks	Total Marks
Part I	Languages	4	3	12	100	400
Part II	English	4	3,2,3,3	11	100	400
Part III	Allied (Odd Semester)	2	4	8	100	200
	Allied (Even Semester)	2	4	8	100	200
	Allied Practical (Even Semester)	2	2,3	5	100	200
	Electives	3	5,3	11	100	300
	Core Theory	10	(3-6)	49	100	1000
	Core Practical (Even Semester)	4	3,4	14	100	400
Part IV	Environmental Science	1	2	2	100	100
	Soft Skill	1	1	1	100	100
	Value Education	1	2	2	100	100
	Non-Major Elective	2	2	4	100	200
	Skill Based	4	3	12	100	400
Part V	Extension Activities	-	1	1	50	50
	Total	**40**		**140**		**4050**

B.Sc., ZOOLOGY (MAJOR & ALLIED)

SUBJECT NAME & SUBJECT CODE

CORE THEORY:

S.NO.	Part Theory	Paper	Subject	Code	Page No
1	III	1	Invertebrata	17U1ZO1	
2	III	2	Chordata	17U2ZO2	
3	III	3	Cell & Molecular Biology	17U3ZO3	
4	III	4	Genetics	17U4ZO4	
5	III	5	Bio-technology, Bio-statistics & Bio-informatics	17U5ZO5	
6	III	6	Developmental Biology & Immunology	17U5ZO6	
7	III	7	Animal Physiology	17U5ZO7	
8	III	8	Environmental Biology	17U6ZO8	
9	III	9	Economic Zoology	17U6ZO9	
10	III	10	Evolution	17U6ZO10	
CORE PRACTICAL					
11	III	1	Invertebrata & Chordata	17U2ZOPR1	
12	III	2	Cell and Molecular Biology & Genetics	17U4ZOPR2	
13	III	3	Animal Physiology & Developmental Biology & Immunology	17U6ZOPR3	
14	III	4	Environmental Biology & Economic Zoology & Bio-technology	17U6ZOPR4	
ALLIED- THEORY					
15	III	1	Allied Zoology-I for (Chemistry Major)	17U1AZO1	
16	III	2	Allied Zoology-II for (Chemistry Major)	17U2AZO2	
17	III	3	Economic Entomology And Pest Management-I	17U3AZO3	
18	III	4	Economic Entomology And Pest Management -II	17U4AZO4	
ALLIED PRACTICAL					
19	III	1	Allied Zoology-Practical (for Chemistry Major)	17U2AZOPR	
20	III	2	Economic Entomology And Pest Management	17U4AZOPR	
ELECTIVE					
21	III	1	Medical Lab Techniques	17U5ZOE1	
22	III	2	Bio-instrumentation	17U6ZOE2	
23	III	3	Microbiology	17U6ZOE3	
24	IV	-	Environmental Studies	12U1ENV	
25	IV	-	Value Education	12U2VE	
SKILL BASED SUBJECT					
26	IV	1	Public Health &Hygiene	17U3ZOSB	
27	IV	2	Apiculture	17U4ZOSB	
28	IV	3	Pisciculture	17U5ZOSB	
29	IV	4	Poultry Farming	17U6ZOSB	
NON-MAJOR ELECTIVE					
30	IV	1	Vermiculture	17U3ZONM	
31	IV	2	Sericulture	17U4ZONM	

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS)
VELLORE- 632 002
BACHELOR OF SCIENCE
B.Sc., ZOOLOGY
SYLLABUS (UNDER CBCS) W.E.F. 2017-2018

SEMESTER-I   **[17U1ZO1]**

CORE PAPER-I
INVERTEBRATA

OBJECTIVE:

To understand the systematic and functional morphology of various groups of invertebrates. To study their economic importance, affinities and adaptations.

UNIT - I

Principles of Taxonomy - Binomial nomenclature - classification of the animal kingdom.
PROTOZOA: General characters and classification upto class with examples. Type study-*Paramecium*, Parasitic Protozoans [*Entamoeba, Leishmania* and *Plasmodium*]

UNIT - II

PORIFERA: General characters and classification upto classes with examples. Type study - Sycon, Canal system in sponges-Corals and coral reefs.

COELENTERATA: General characters and classification upto classes with examples. Type study - Obelia, Polymorphism in coelenterates.

UNIT - III

HELMINTHES: General characters and classification upto classes with examples. Type study – Fasciola hepatica. Nematode parasites of human - *Wuchereria bancrofti*, *Ascaris lumbricoides*, *Ancylostoma duodenale*.

ANNELIDA: General characters and classification upto classes with examples. Type study: Leech, Metamerism in Annelids.

UNIT - IV

ARTHROPODA: General characters and classification upto classes with examples. Type study - Prawn, *Peripatus* and its affinities, Vector borne diseases and their control.

UNIT - V

MOLLUSCA: General characters and classification upto classes with examples. Type study – *Pila globosa*- Economic importance of Molluscs.

ECHINODERMATA: General characters and classification upto classes with examples. Type Study- Sea star, Echinoderm larvae and their significance.

REFERENCE BOOKS

❖ **Adam Sedgwick. 1972** A student text book of Zoology. Vol.I and II. Central book Depot. Allahabad.

❖ **Barnes**. Invertebrate Zoology. Toppan International Co.

❖ **Barrington, E.J.W. 1969.** Invertebrate structure and function. ELBS Publication.

❖ **Ekambaranatha Ayyar.M. and T.N. Ananthakrishnan, 1992.** Manual of Zoology Vol.1 [Invertebrata], Viswanathan [Printers and Publishers] Pvt. Ltd.; Madras.

❖ **Hyman L.H.** The Invertebrate Vol.I-IV. 1955, McGraw Hill Co. New York.

❖ **Jordan, E.L. and P.S.Verma, 1993**. Invertebrate Zoology, 12th Edition S.Chand & Co.Ltd, New Delhi.

❖ **Kotpal, R.L. 1988-1992** Protozoa, Porifera, Coelenterata, Helminthes, Annelida, Arthropoda, Mollusca, Echinodermata. Rastogi Publications, Meerut.

❖ **L.A Borradile and F.A.Pott.** The Invertebrates. Cambridge University Press. UK.

❖ **P.S.Dhami and J.K.Dhami.** Invertebrate Zoology, S.Chand and Co. New Delhi.

❖ **Parker and Haswell, 1964**. Test Book of Zoology. Vol.1 [Invertebrata]. A.Z.T; B.S.Publishers and distributors, New Delhi.

ENVIRONMENTAL STUDIES [12U1ENV]
(For all UG Degree Courses)

UNIT-I: INTRODUCTION TO ENVIRONMENTAL SCIENCES:

NATURAL RESOURCES:

Environmental Sciences-Relevance-Significance-Public awareness-Forest resources-Water resources-Mineral resources-Food resources-Conflicts over resource sharing-Exploitation-Land use pattern-Environmental impact-fertilizer-Pesticide Problems-case studies.

UNIT-II: ECOSYSTEM, BIODIVERSITY AND ITS CONSERVATION:

Ecosystem-Concept-Structure and Function-producers, consumers and decomposers-Food chain-Food web-Ecological pyramids-Energy flow –Forest, Grassland, desert and aquatic ecosystem.

Biodiversity-Definition – genetic, species and ecosystem diversity – values and uses of biodiversity-biodiversity at global, national (India) and Local levels-Hotspots, threats to biodiversity-conservation of biodiversity- Insitu & Exsitu.

UNIT-III: ENVIRONMENTAL POLLUTION AND MANAGEMENT

Environmental Pollution – Causes-Effects and control Measures of Air, Water, Marine, Soil, solid waste, Thermal, Nuclear pollution and Disaster Management-Floods, Earth quake, Cyclone and Land slides. Role of individuals in prevention of pollution-pollution case studies.

UNIT-IV: SOCIAL ISSUES-HUMAN POPULATION

Urban issues-Energy-water conservation –Environmental Ethics-Global warming-Resettlement and Rehabilitation issues-Environmental legislation-Environmental production Act. 1986-Air, Water, Wildlife and forest conservation Act- Population growth and Explosion – Human rights and Value Education – Environmental Health-HIV/AIDS-Role of IT in Environmental and Human Health-Women and child welfare – Public awareness – Case studies.

UNIT-V: FIELD WORK

Visit to a local area / local polluted site/ local simple ecosystem – Report submission

REFERENCE BOOKS:

- **Kalavathy,S. (ED.) 2004,** Environmental Studies, Bishop Heber College Pub.,

- **Kumarasamy,K., A.Alagappa Moses and M.V.Asanthy, 2004,** Environmental

  Studies, Bharathidasan University Pub,1, Trichy.

- **Rajamannar, 2004,** Environmental Studies, EVR College Pub, Trichy.

  Trichy.
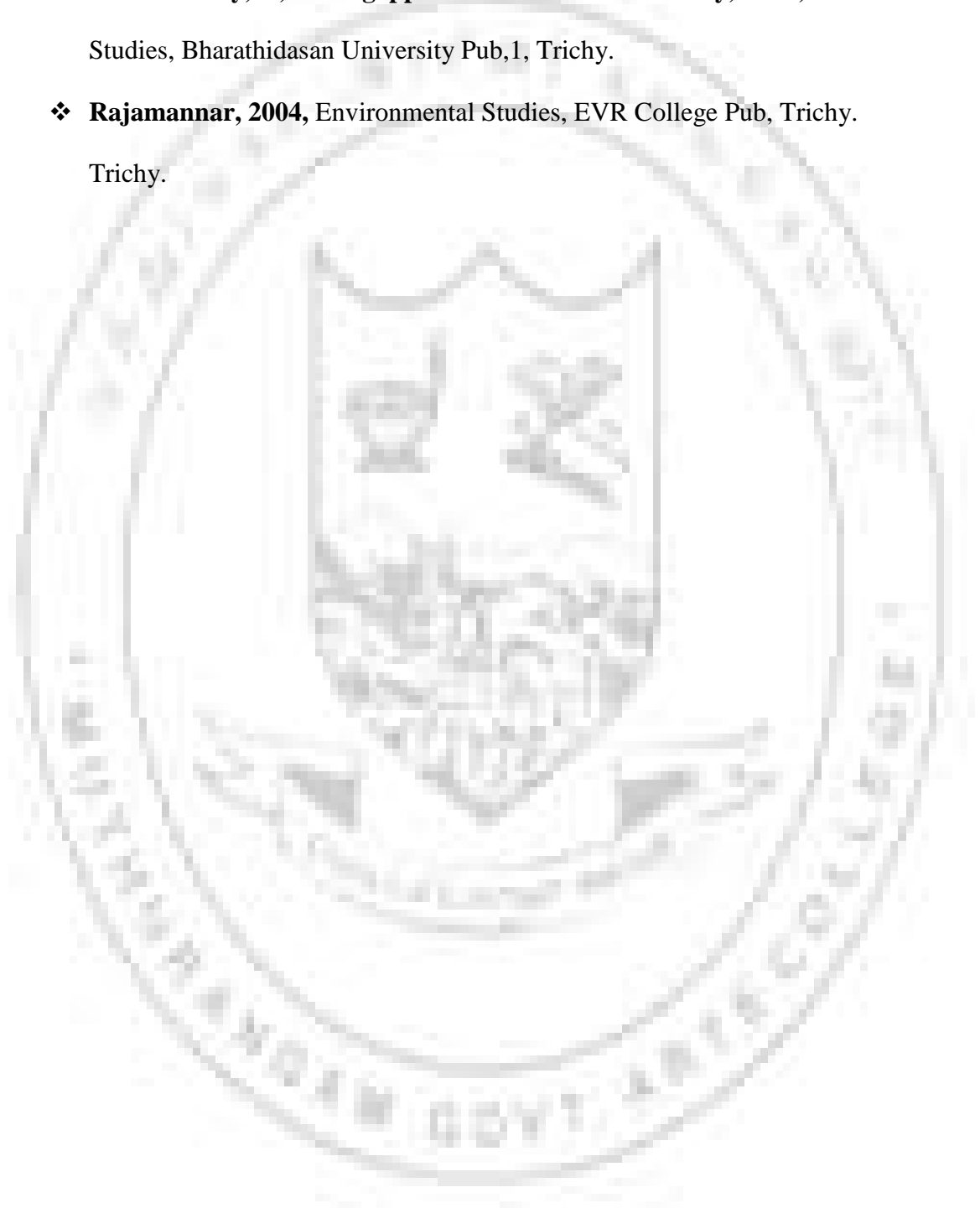
SEMESTER II
CORE PAPER - 2
CHORDATA [17U2ZO2]

Objectives:

- ❖ To understand the systematic and functional morphology of various groups of chordates.
- ❖ To study their affinities and adaptations to different modes of life.

UNIT - I

Salient Features and General classification of Phylum Chordata upto orders. Origin of Chordata.

PROCHORDATA: General Characters and Classification, Type study: *Amphioxus* & Its affinities. Retrogressive Metamorphosis of Ascidia, Affinities of *Balanoglossus*.

UNIT -II
PISCES

General characters and classification upto orders.

Type study: *Shark*.

Migration of fishes.

AMPHIBIA

General characters and classification upto orders.

Type study: *Frog*

Adaptive radiation in Amphibians.

Parental care in Amphibia. Neoteny in Urodela

UNIT - III
REPTILIA

General characters and classification upto orders.

Type study - *Calotes*.

Poison apparatus and biting mechanism of poisonous snakes.

Identification of poisonous and non - poisonous snakes, Venoms, Bites and First-aids.

UNIT - IV
AVES

General characters and classification upto orders.

Type study -*Pigeon*

Archaeopteryx & It's evolutionary significance

Flightless birds.

Flight adaptation in birds and Migration of birds.

UNIT - V
MAMMALIA

General characters and classification upto orders.

Type study - *Rabbit*

Dentition in mammals.

Aquatic mammals & their adaptation.

REFERENCE BOOKS

❖ **Ekambaranatha Ayyar, M and T.N Anantha Krishnan 1992**, A manual of zoology Vol. II [Chordata]. S. Viswanathan [Printers and publishers] Pvt. Ltd., Madras.

❖ **Hyman. L.H**. Comparative vertebrate zoology. McGraw Hill co. New York.

❖ **Jollie. M. 1968**. Chordate Morphology. East west press Pvt. Ltd., New Delhi.

❖ **Jordan E. L. and P.S. Verma 1995.** Chordate Zoology and elements of Animal Physiology. S. Chand and co., New Delhi.

❖ **Kotpal R.L. 1992.** Vertebrata, Rastogi publication, Meerut.

❖ **Nigam. H.C 1983** Zoology of chordates, Vishal publications, Jalandhar.

❖ **Waterman, Allyn J.et al., 1971,** Chordate Structure and functions, MacMillan and co., New York.

CORE PRACTICAL - I
INVERTEBRATA AND CHORDATA[17U2ZOPR1]

DISSECTIONS

Cockroach - Digestive and Nervous system

Prawn - Nervous system

Frog-Digestive system, Arterial and Venous system & Urino-genital system (Chart/Model)

MINOR PARCTICAL

MOUNTING

Mouth Parts: *Cockroach*, Honey bee, and Mosquito, Earthworm-Body seta & Penial seta, Prawn-Appendages Shark - Placoid scales.

SPOTTERS

I: Study of the following specimens to bring out and their adaptations to their respective modes of life.

Entamoeba, Plasmodium, Sycon, Taenia solium, Fasciola, Ascaris, Leech, Limulus, Any two Crustacean Larvae, Starfish, Balanoglossus, Ascidian, Ichthyophis, Draco and *Bat*.

II: Study of the following specimens to bring out their biological significance:

Obelia, Corals [Any 3], *Physalia, Porpita, Vellela, Peripatus, Sacculina on Crab, Sea Anemone on Hermit Crab, Bipinnaria Larva, Amphioxus, Shark, Hippocampus, Narcine, Echeneis, Flying Fish, Eel, Cobra, Krait, Russels Viper, Echis carinata, Python, Pigeon,* and *King Fisher*.

III. Study of the following to relate structure and function:

Sponge Spicules, *Obelia Polyp, Taenia Scolex, Nereis* - Parapodium, Prawn appendages, Pedicellaria of *Star fish*, Placoid Scale of *Shark*, Quill Feather of *Pigeon*.

IV.Study of the following to draw labeled sketches:

T.S. of Nereis, T.S. of Leech, Obelia Medusa, T.S. of Amphioxus through Pharynx, T.S. of Star fish through arm.

V.Osteology

Study of the following skulls with reference to dentition-Dog and Rabbit

Pectoral girdles of *Frog, Calotes, Pigeon, Rabbit/ Rat*.

Pelvic Girdles of *Frog, Calotes, Pigeon, Rabbit/ Rat*.

Synsacrum of *Pigeon*.

VI. RECORD

REFERENCE BOOKS:

❖ **Jayanpa Sinha. 2010** Advanced Practical Zoology, Books & Allied (p) Ltd. No.1. Subham Plaza, I – Floor, Calcutta.

❖ **Verma. P.S. 2011** "A Manual of Practical Zoology" CHORDATES, Chand & co, Ltd. Ram Nagar - New Delhi.

❖ **Verma. P.S. 2011** "A Manual of Practical Zoology" INVERTEBRATES Chand & Co, Ltd, Ram Nagar, New Delhi.

VALUE EDUCATION [12U2VE]
(For all UG Degree Courses)

UNIT-1

Value Education-Definition-relevance to present day-Concept of Human Values-Self introspection-Self esteem.

UNIT-II

Family values-Components, Structure and responsibilities of Family-Neutralization of anger-Adjustability – Threats of family life-Status of Women in family and society-Caring for needy and elderly – Time allotment for sharing ideas and concerns.

UNIT-III

Ethical values-Professional ethics-Mass media ethics-Advertising ethics-Influence of ethics on family life – psychology of children and youth-Leadership qualities-Personality development.

UNIT-IV

Social Values –Faith, service and secularism-Social sense and commitment – Students and Politics-Social awareness, Consumer awareness, Consumer rights and responsibilities-Redressal mechanisms.

UNIT-V

Effect of international affairs on Values of life/Issue of Globalization-Modern warfare-Terrorism. Environmental Issue-mutual respect of different cultures, religions and their beliefs.

REFERENCE BOOKS:

❖ **Anchukandam T, Kuttainimathathil J. (Ed)** Grow Free Live Free, Krisitu Jyoti Publications, Bangalore (1995).

❖ **Daniel and Selvamony**. Value Education Today, (Madras Christian College, Tambaram and ALACHE, New Delhi, 1990).

❖ DBNI, NCERT, SCERT, Dharma Bharti National Institute of Peace and Value Education, Secunderabad, 2002.

❖ **Ignacimuthu S**. Values for Life – Better Yourself Books, Mumbai, 1991.

❖ **Mani Jacob (Ed)** Resource Book for Value Education, Institute for Value Education, New Delhi 2002.

❖ **Mascaronhas MMM.** Centre for Research Education Science adn Training for Family Life Promotion – Family Life Education, Bangalore, 1993.

SEMESTER III

CORE PAPER-3

CELL AND MOLECULAR BIOLOGY [17U3ZO3]

Objectives:

❖ To learn the cytological techniques, the structure and functions of various cellular components.
❖ To understand the integrated activity of the whole cell as in mitosis, meiosis and protein synthesis.
❖ To understand the molecular basis of cell structure DNA structure and functions.

UNIT - I

Introduction to cell and molecular biology, Cell theory, protoplasm theory, Prokaryotic and Eukaryotic cells. Microscopes-light, phase contrast and electron microscopes [SEM &TEM]- cell fractionation.

UNIT - II

Structure and function of Cell organelles–Plasma membranes, Mitochondria, Golgi Complex, Endoplasmic reticulum, Ribosomes, Lysosomes and Centrioles.

UNIT - III

Nucleus –Ultra structure, Composition and Function - Nuclear Membrane- Nucleoplasm- Chromosomes, Heterochromatin, Euchromatin: Giant chromosomes, Polytene Chromosomes, Lampbrush chromosomes-Occurrence and structure.

UNIT - IV

Cell cycle, and cell division-Amitosis, Mitosis and Meiosis and their significance. Cytology of Cancer, types, characteristics and causative agents.

UNIT - V

Structure and function of DNA and Types of RNA [mRNA, tRNA and rRNA], Semi conservative replication, mechanism and enzymology of DNA replication, Protein synthesis.

REFERENCE BOOKS:

❖ **Cohn, N.S., 1979,** Elements of Cytology, Freeman Book co., New Delhi.

❖ **De Robertis, E.D.P. and E.M.F. De Robertis, 1988**. Cell and molecular Biology, 8th Edition, International Edition Informes, Hongkong. 734p.

❖ **Gies, A.C., 1979**. Cell Physiology, Saunders co., Philiadelphia, London, Toronto, 609p.

❖ **Jayanthi G.P. 2009** Molecular Biology, M.J P Publ. Chennai.

❖ **Powar, C.B.,1989**.Essentials of Cytology, Himalaya Publishing House, Bombay, 368p.

❖ **Rastogi. S.C.** Cell and Molecular Biology, 2008 2nd Edition, New Age International (p) Ltd., New Delhi.

❖ **Verma, P.S., and V.K. Agarwal, 1995**. Cell and Molecular Biology, 8th Edition, S. Chand & Co., New   Delhi, 567p.

ALLIED – PAPER-3

ECONOMIC ENTOMOLOGY & PEST MANAGEMENT-I
[17U3AZO3]

Objectives:

- ❖ To study the insect pests and their control measures.
- ❖ To study the economic importance of insects as vectors, pollinators, predators & parasites.

Unit-I

Economic importance of Insects-Brief account of morphology, classification of insects-General developmental stages of Insects.

Unit-II

Beneficial insects-productive insects-Economic importance of Honey bees, silkworms & Lac insect. Helpful insects-Insect Pollinators, Predators & parasites, Scavengers.

Unit III

Harmful Insects-Insects of Agricultural importance-Types of Damage to plants by insects-Insect pests-causes for insects assuming pest status-pest surveillance.

Unit IV

Insect pests of crops-pest of Rice wheat, sugarcane, groundnut, coconut, mango, cotton. Pest of vegetables.

Unit V

Insect pests of stored products-Insect pests of domestic animals-Insects in relation to public health & household. Non-insect pest (Nematode, mites, rodents & birds) and their control.

REFERENCE BOOKSS:

- ❖ **David, B.V. - 1992**. Pest Management and Pesticides Indian Scenario, Namratha Publications, Madras.

- ❖ **David, B.V. and T. Kumarasamy, 1984**. Elements of Economic Entomology, Popular Book Depot, Madras, 536 pp.

- ❖ **Metcalf, C.L. and W.P. Flint, 1973.** Destructive and Useful Insects. 4th ed., Tata McGraw Hill Publishing Co Ltd. New Delhi - 110 051, 1087 pp.

- ❖ **Nayar, K.K. T.N. Ananthakrishan and B.V. David. 1992**. General and Applied Entomology. Tata McGraw Hill Publishing Co Ltd., New Delhi - 110 051.

- ❖ **Ramkrishna Iyer, T.V.,** - Economic Entomology, Government Publications Madras.

- ❖ **Roya D.N. and A.W.A. Brown (eds), 1981.** Entomology Medical and Veterinary (3rd ed.), The Bangalore Printing and Publishing Company, Bangalore - 8.

SKILL BASED SUBJECT-PAPER - 1
PUBLIC HEALTH AND HYGIENE [17U3ZOSB]

Objectives:

❖ To impart awareness on public health and hygiene

❖ To create knowledge on Health Education.

UNIT-1

Health Education: Concepts of health-Health education agencies-Government and voluntary organizations and their role in health services. Indicators of health-WHO programmes in health management -National health policies -National health mission-NRHM-NUHM- Nutrition and health. Nutritional deficiency diseases.

UNIT -II

Mental health–Types of mental illness-Phobia-schizophrenia – mood disorders – anxiety status, Avoidance, Manic, Depressive psychosis; Hypertension-stroke. Smocking-Tobacco chewing-Alcoholism and drug addiction and de addiction.

Unit-III

Environmental Health: Water borne diseases; Water purification – Boiling, Chlorination, Filtration and Reverse osmosis. Air: Ventilation – Natural and Mechanical ventilation – prevention and control of air pollution; waste – degradable and Non-degradable wastes. Collection and disposal of wastes.

Unit-IV

Personal health: Physical fitness-exercise (Yoga). Spiritual health (meditation). Good hygiene practices. Oral and dental hygiene- Menstrual hygiene. **Occupational health** – Occupational health hazards -Asbestosis – silicosis; risks and treatment; safety measures in work place– First Aid – ESI – Health insurances.

Unit-5: Communicable Diseases:

Communicable diseases-infections – symptoms and control measures of Amoebiasis – Filariasis-Measles-Polio-Chikungunya-Rabies – Plague – Leprosy – Tuberculosis –AIDS.

Non-Communicable Diseases: Diabetes, Coronary heart diseases Blood pressure & Stroke.

REFERENCE BOOKS:

- ❖ **Ahmed.M.N., 2005.** Hygiene and Health, Anmol Publications.

- ❖ **Michael. J. J.Gibrey.1986.** Nutrition diet and health, Cambridge Uni. Press.

- ❖ **Park.K., 1994**. Textbook of Preventive and Social Medicine, 14th edition Banarsidas Bhanot Publishers New Delhi.

- ❖ **Sumati.R., Mudambi, M.V.Rajagopal, 1985.** Fundamentals of foods and

- ❖ **Udai Veer., 2005**. Nutrition and Health, Anmol Publications.
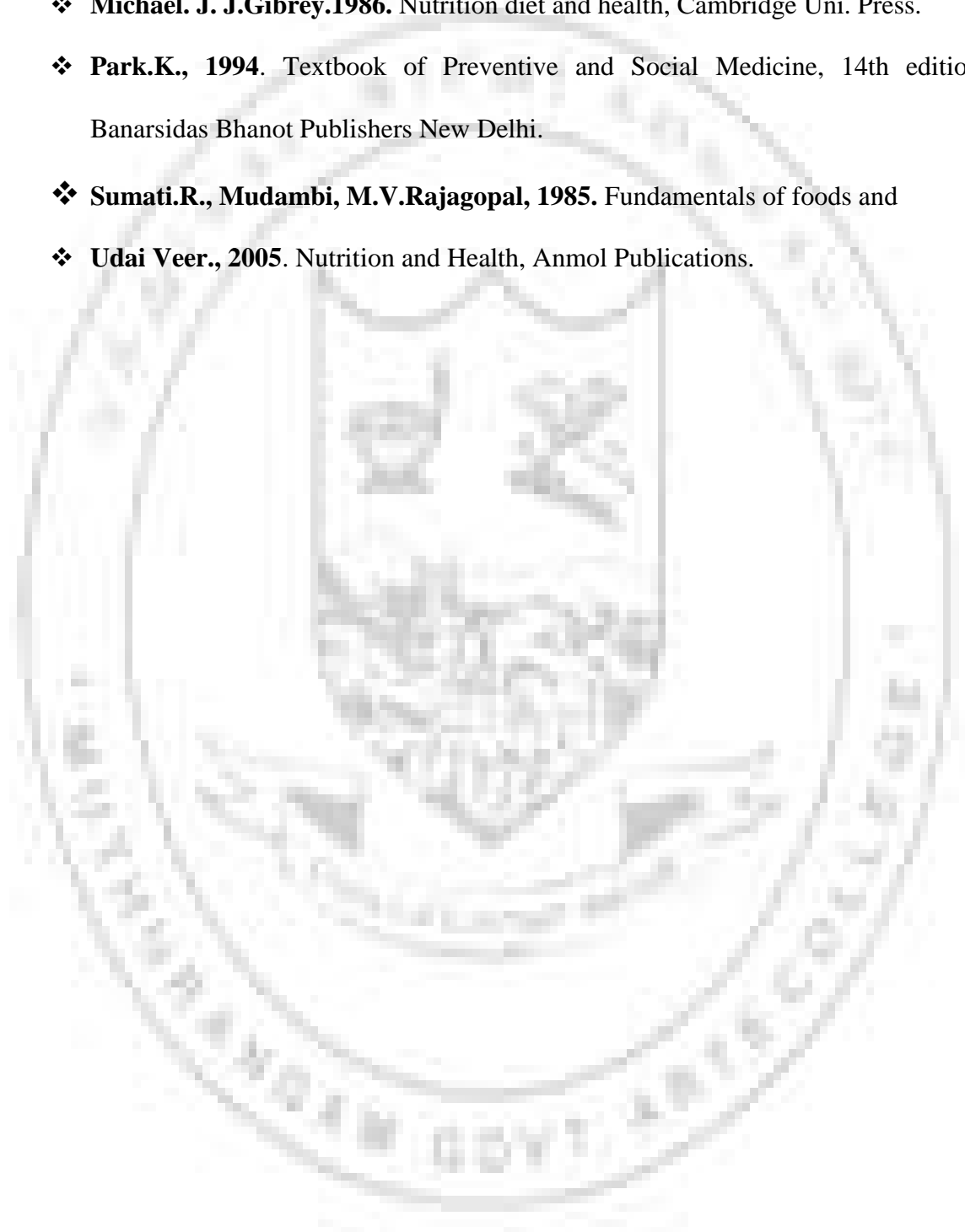
NON - MAJOR ELECTIVE-PAPER - 1
VERMICULTURE [17U3ZONM]

OBJECTIVE:

❖ To impart training on Earthworm culture technology

❖ To create knowledge on Self - Employment opportunity

UNIT - I

Earthworm classification-types of earthworm - Morphological and Anatomical characteristics. Biology of *Lampito maruitti*.

UNIT - II

Vermicomposting materials and their classification. Feeding habits and food for composting worms.

UNIT - III

Vermicomposting methods such as - Small scale and large scale pit method, heap method, windrow method etc., factors affecting vermicomposting such as pH, Moisture, temperature etc.

UNIT - IV

Vermicomposting: General procedure in Homes. Maintenance of vermicomposting beds. Harvesting the worms. Earthworm Predators, parasites and pathogens.

UNIT - V

Application of Vermicomposting in Agriculture and Horticultural practices.

Advantage of Vermicomposting.

REFERENCE BOOKS:

❖ **Edwards, C.A., and Bother, B. 1996:** Biology of Earthworms - Chapman Hall Publ. Co., London.

❖ **Gupta, P.K. 2008**: Vermicomposting for sustainable agriculture [2nd edition] - Agrobios - India.

❖ **Ismail, S.A. 1997:** Vermitechnology - the Biology of Earthworms - Orient Longman Publ. - India.

❖ **Ranganathan, L.S. 2006:** Vermibiotechnology from soil health to Human health - Agrobios - India.

❖ **Talashikar, S.C. 2008:** Earthworms in Agriculture - Agrobios - India

SEMESTER IV
CORE PAPER - 4
GENETICS [17U4ZO4]

Objectives :

❖ To know the principles of genetics, pedigree analysis and population genetics.

❖ To learn some genetic studies in man and Applied Genetics.

GENETICS

UNIT-I

Introduction to Genetics - Basis of Mendelian Inheritance and Mendelian laws. Incomplete dominance and co-dominance, Pleiotropism. Interaction of genes: Allelic and non allelic interactions, supplementary genes, complementary genes. Polygenic (quantitative) inheritance.

UNIT-II

Multiple alleles: Definition, characteristics and examples: coat colour in rabbits, Rh factor and erythroblastosis foetalis; Blood Groups and their Inheritance in Human – Linkage and Crossing Over: Complete and Incomplete Linkage, Linkage Groups, Crossing Over types, Mechanisms, Mapping of Chromosomes.

UNIT-III

Sex determination: sex chromosomes; X and Y male heterogametic and female heterogametic chromosomes. Mechanism of sex determinations [XX-XO, XX-XY, ZZ-ZW types]; Sex-linked, sex-influenced and sex-limited characters – Pedigree analysis.

UNIT-IV

Mutation: Definition – kinds of mutations – gene mutations – molecular basis of gene mutations – substitution mutations and frame shift mutations – mechanisms – factors influencing mutations – induced mutations – mutagens. Chromosome mutations – numerical and structural changes. Numerical changes: euploidy and aneupoloidy. Structural changes: deletion, duplication, insertion, inversion, translocation.

UNIT-V

Human Genetics - Normal chromosome component in human beings, classification and grouping of human chromosomes - Chromosomal anomalies and disorders: Down's, syndrome, sex chromosomal anomalies like Turner's and Klinefelter's syndromes, Gene mutations: autosomal mutations like albinism, PKU, alkaptonuria

REFERENCE BOOKS

❖ **Burns, George, W.** (New edition)-The Science of Genetics.

❖ **Garder, 1972.** Principles of Genetics, Wiley Eastern Pvt. Ltd. 590 pp.

❖ **Goodenough, V., 1978.** Genetics, 2nd ed., New York Holt, Rinchart and Winston, 894 pp.

❖ **Gunther, S. Stent, 1986.** Molecular Genetics. Macmillan Publishing Co Inc. 773 pp.

❖ **Hart, D.L. and D. Freifelder, 1888.** Basic Genetics, John & Barlet Publishers, 505 pp.

❖ **Pai, A.C., 1974.** Foundations of Genetics, McGraw Hill Publications, New York, 464 pp.

❖ **Stickberger, 1968.** Genetics, Macmillan Publications, New York, 914 pp.

❖ **Verma PS, & V.K. Agarwal (1999).** Concept of Genetics, Human genetics & Eugenics. S. Chand & Company.

❖ **Verma, P.S. and V.K. Agarwal, 1995**. Genetics, 8th edition, S. Chand & Co., New Delhi – 110 055, 580 pp.

❖ **Watson, J.D. and W.A. Benjamin, 1976.** Molecular Biology of the Gene, 3rd., Benjamin Co. Inc., New York, 739 pp.

❖ **Weaver, Robert and Brown, William C, 1996.** Genetics, Tata McGraw Hill Publishing Co Ltd., New Delhi, 656 pp.

❖ **Winchester, 1967.** Genetics, Oxford IBH Publications, 504 pp.

CORE PRACTICAL – II
CELL AND MOLECULAR BIOLOGY AND GENETICS [17U4ZOPR2]

CELL AND MOLECULAR BIOLOGY

➢ Use of microscope, camera Lucida, Stage ad Ocular Micrometers

➢ Blood Smear Preparation - Differential count of W.B.C.

➢ Total count of RBC and WBC using Haemocytometer.

➢ Mounting of Buccal Epithelium.

➢ Mitosis in onion root tip squash.

➢ Squash preparation of Grasshopper testes (or) Squash preparation of Salivary glands of chironomous larva.

STUDY OF PREPARED SLIDES OF HISTOLOGY

➢ Columnar Epithelium

➢ Ciliated epithelium

➢ Glandular Epithelium

➢ Cartilage T.S.

➢ Bone T.S.

➢ Cardiac Muscle

➢ Striated muscle

➢ Non Striated muscle

➢ Neuron

➢ Male germ cell

➢ Female germ cell

GENETICS

➢ ABO blood grouping-Rh Typing

➢ PTC Test

➢ Giant chromosome of Chironomous larva-Permanent slide

➢ Drosophila mutants-Vestigial wing, white eye, yellow body

ALLIED PAPER - 4
ECONOMIC ENTOMOLOGYAND PEST MANAGMNET-II
[17U4AZO4]

Objectives:

To study the basic concepts of pesticides and integrated pest control

Unit I

Principles of pest control, Insect control methods - Natural; applied–mechanical, Cultural control, chemical control and Biological control.

Unit II

Integrated pest management- Recent trends in pest control - Pheromones, Attractants, Repellents and Antifeedants, chemosterilants.

Unit III

Electromagnetic energy in insect control-Manipulation of Animal behavior in pest control-Uses of genetic manipulation in pest control.

Unit IV

Pesticides- Insecticides formulation- classification of Insecticides dusts, granular or pelletted and Liquid-Fumigants- Handling pesticides, First Aid for Pesticide Poisoning and precautions-Antidotes- Pesticides & Environment .

Unit-V

Plant production appliances- Insect collecting net, Hand sprayers, Power sprayers. Hydraulic knap sack sprayer and rotary duster, Air-craft application of pesticides, Aerosols-Insecticides smokes, Vapourizers.

REFERENCE BOOKS

❖ **David, By, and T. Kumarasamy, 1984**. Elements of Economic Entomology, Popular Book Depot, Madras, 536 pp.

❖ **Nayar, K.K. T.N. Ananthakrishan and By. David. 1992.** General and Applied Entomology. Tata McGraw Hill Publishing Co Ltd., New Delhi - 110 051.

❖ **Ramakrishna Iyer, T.V., -** Economic Entomology, Government Publications, Madras.

ALLIED PRACTICAL - II
ECONOMIC ENTOMOLOGYAND PEST MANAGMNET
[17U4AZOPR]

I.MAJOR PRACTICAL   (Model / Chart)

➢ Life cycle of Holometabolous, Hemimetabolous and Ametabolous Insects

[At least one example in each]

➢ Insect formulations and plant protection appliances.

II.MINOR PRACTICAL   (MOUNTING)

➢ Mouth parts - *Bed Bug*, *Mosquito* and *House fly*

➢ Sting apparatus of Honeybee.

III. SPOTTERS

Pests of agricultural Importance - Citrus *Butterfly*, *Rhinocerous beetle*, Stem borer - Rice, Sugar cane, Cholam, Cotton, Fruit borer, Root borer, six spotted beetle, grasshopper, Crickets, Pod Borer [pulses], Rice weevil, Mango nut weevil. Pest of Medical Importance - *Mosquito*, *Housefly*, *Cockroach*, Ticks, Mites, Louse, Bed Bug, *Plasmodium*, Filarial Worm, Loa Loa, Dust mite.

IV: INSECT BOX

Students should collect minimum of 10 whole mounts of the insects for the insect box.

IV. RECORD

SKILL BASED SUBJECT - PAPER - 2
APICULTURE [17U4ZOSB]

OBJECTIVE:

Entrepreneur motivation for practicing apiculture as cottage industry.

Unit-I

History - Biology and taxonomical status of honey bee, Life history of honey bee, Species of honey bee, Social organization of honey bee colony. Present status of Apiculture in India.

Unit-II

Bee colony, Castes. Natural colonies and their yield. Types of beehives - structure - location, care and management - Genetic studies - breeding of stocks - winterbroods.

Unit-III

Bee foraging: Pollen and nectar yielding plants. Honey extraction, seasonal maintenance, swarming and supersedure - pheromone.

Unit-IV

Natural enemies and diseases of honey bees and control methods. Bee poisoning and utility of bees in toxicity studies. Economics of Apiculture and Management.

Unit-V

Honey yield in national and international market. Prospects of apiculture as self employment venture. Preparing proposals (Layout and budget) for financial assistance and funding agencies. Uses of honey and beeswax in Indian medicine.

REFERENCE BOOKS:

➢ **Honey - A** Comprehensive survey - International Bee Research Association for House - CNRC [England].

➢ **Nalina Sundari M.S. 2006**, Entomology M.J.P Publications, Chennai.

➢ **Roger. A. Morse,1990.** The ABC & XYZ of Bee culture, 40th ed., A.I Root & Co, Medina, Ohio 44256.516pp

➢ **Sardar Singh,** Bee keeping in India.

➢ **Sharma.P.L., & Singh S**. Hand Book of Bee Keeping.

NON-MAJOR ELECTIVE - PAPER - 2
SERICULTURE [17U4ZONM]

Objective:

- ❖ To impart training on silk worm culture technology
- ❖ To create knowledge on self employment opportunity

UNIT - I

Classification of commercial varieties of mulberry. Moriculture-Mulberry plantation establishment and cultivation practices.

UNIT - II

Diseases of mulberry - fungal, bacterial, viral and nematode diseases, deficiency diseases and their remedial measures.

UNIT - III

Silkworm-Biology & Life-cycle-Silkworm rearing operations - Chawki rearing and late age rearing techniques & rearing appliances.

UNIT - IV

Physical and commercial characters of cocoons. Reeling operations, Raw silk-importance of by – products of Sericulture.

UNIT - V

Economics of Sericulture - Future and progress of sericulture industry in India. Prospects of sericulture as self employment venture.

REFERENCE BOOKS:

➤ **Ganga, G. 2003**: Comprehensive sericulture Vol -II Silkworm rearing - Oxford - IBH Publ. Co. India.

➤ **Ganga, G. 2003:** Comprehensive sericulture Vol-l, Moriculture - Oxford -IBH Puubl. Co. India.

➤ **Ganga, G. and Sculochana Chetty, J. 1997:** An Introduction to sericulture Oxford - IBH Publ. Co. India.

SEMESTER- V

CORE PAPER - 5

BIOTECHNOLOGY, BIOSTATISTICS AND BIOINFORMATICS [17U5ZO5]

OBJECTIVE:

BIOTECHNOLOGY

- ❖ To integrate biology with technology.

- ❖ To study the application of scientific and engineering processes in the processing of materials by biological agents.

BIOSTATISTICS

- ❖ To get a basic knowledge of statistical methods and computations in Biology.

- ❖ To study the application of information sciences [mathematics, statistics and computer sciences] in Biology.

BIOINFORMATICS

- ❖ To develop, support and enhance public information resource for biotechnology e.g. Gene banks, molecular biology data and related research information resources

BIOTECHNOLOGY

UNIT - I

Definition - Tools of Genetic Engineering - Enzymes, Linkers and Adaptors, Cloning vectors [plasmids, pBr322, Phage (λ), Cosmids and phagemids]. Recombinant DNA Technology, Application of Recombinant DNA technology in Medicine & Agriculture. Nanotechnology and its application.

UNIT-II

Production of biotechnological Products-food SCP [algae,yeast,mushroom]-Biofertiliser-Biofuel-Biopesticides-Biogas production. Waste and sewage management-Effective microorganisms-Enzyme biotechnology-sources and production of commercially important enzymes such as cellulase, amylase, pectinases, proteinases.

BIOSTATISTICS

UNIT - III

Biostatistics - Definition and Scope, Census and sampling methods - collection and presentation of data. Diagrams and graphs; bar, pie Histogram, Line graph - concept of Statistical population and sample characteristics of frequency distribution sampling.

UNIT - IV

Measures of central tendency: mean, median and mode. Measure of Dispersion, Range, Quartile deviation, Mean deviation & Standard deviation-Chi square test and t-Test.

BIOINFORMATICS

Unit-V

Bioinformatics-Definition: Scope and Application, Biological Data Bases, Objective & Properties, Literature Data Bases-NCBI-Pub med, Med Line-Protein Sequence Data Bases-PIR.

REFERENCE BOOKS:

- ❖ **Arthur. M. Lesk**, Introduction to Bioinformatics, Oxford University Press, New Delhi, 2003.
- ❖ **Arthur. M. Lesk,** Introduction to protein Structures Oxford University Press, New Delhi, 2000.
- ❖ **Baxevanis, A and Outllette.** Bioinformatics a practical guide to the analysis of genes and proteins, Willy - Intersience, Hoboken, NJ. USA 2005.
- ❖ Developing Application with MS-OFFICE _ Christine. Solomon - Microsoft Office Press.
- ❖ Developing Bioinformatics Computer Skills Cynthia Gibbs, Sheoff Publishers & Distributors Pvt. Ltd., Mumbai.
- ❖ **Goutham Roy.** Introduction to Computing and computing lab and Cad [2002] Books and allied [pvt] ltd. Kolkata.
- ❖ **Gupta P.K.** Elements of Biotechnology [2001] Rastogi Publications, Meerut.
- ❖ **Higgins L.I, Best G.J and Jones J [1996]** Biotechnology - principles and applications Blackwell Scientific publications Oxford London.
- ❖ **Jerold H. Zar.,** Bio Statistical analysis [2nd edition] Printice Hall of International edition, 1984   [Relevant portions]
- ❖ **Kuby, J. [1999]** Immunology W.H.Freeman and company, New york.
- ❖ MS. OFFICE for Win - Microsoft office press.
- ❖ **Pelczar Jr.M.J.Chan E.C.S and Kreig N.R.[2001]** MICROBIOLOGY-McGraw Hill Inc. New York
- ❖ **Roitt I.M. [2000]** Essential Immunology. Blackwell Scientific Publishers.
- ❖ **Stainer R.Y., Ingraham J.L., Wheelis M.L. and Painter P.R.[1999]** GENERAL MICROBIOLOGY-Macmillan Education Ltd. London.
- ❖ **Statistics - SP Gupta 1996 S.** Chand and Co., New Delhi.

CORE PAPER- 6

DEVELOPMENTAL BIOLOGY & IMMUNOLOGY [17U5ZO6]

OBJECTIVES:

❖ To study ontogenesis, the development of animals including parthenogenesis.

❖ To study embryonic adaptations, human reproduction and reproductive technology in man.

❖ To study the process which help to maintain the organisms internal environment, when challenged with foreign substances.

❖ To understand the advances in Immunology

DEVELOPMENTAL BIOLOGY

UNIT - I

Modern theories of developmental biology – **Gametogenesis**: spermatogenesis and Oogenesis – vitellogenesis – structure and types of sperms and eggs. **Fertilization**: sperm – egg interactions – biochemical events, post – fertilization event – Parthenogenesis – types and significance.

UNIT - II

Cleavage – patterns and types; Blastulation – Types of Blastula in chick; Gastrulation and morphogenetic movements – Organogenesis – primary organ rudiments – organogenesis of heart and eye in chick; Notogenesis – Fate map and Cell lineage;

UNIT - III

Placenta-Classification-Types-Reproductive technology-Super Ovulation, Artificial insemination, Cryopreservation, In vitro Fertilization (IVF), Test tube babies, Embryo transfer, Amniocentesis.

IMMUNOLOGY

UNIT- IV

Types of immunity - their role in parasitic, bacterial & Viral Infection, in hyper - sensitivity and graft rejection - Lymphoid organs, cells of immune system - their role in immune response - Antigen - Antibody reaction.

UNIT - V

Immunoglobulin - types, structure, Physico-chemical and biological properties - Immunoprophylaxis – Immunization schedule of children. Immuno-deficiency - AIDS, Immunotechniques.

REFERENCE BOOKS:

- ❖ **Balinsky, B.L., 1981.** "Introduction to Embryology" Saundeers, Philadelphia.

- ❖ **Berril & Corp.,** Developmental Biology. McGraw Hill Book Company, MC.,New York.

- ❖ **Current protocols in Immunology - 3** Volumes 1994 Wiley Publications.

- ❖ **Dubey 2006** Text book of Biotechnology S. Chand and Co., New Delhi.

- ❖ **Jain, P.C 1998,** Elements of Developmental Biology. Vishal Publication, New Delhi.

- ❖ **Jayaraj MS.** An Introduction to Embryology, Veer Bala Rastogi Publication.

- ❖ **Kuby. J.1999,** Immunology. W. H. Free man and Co. New York.

- ❖ **Madhavee Latha. P, 2012.** Text book of Immunology, S. Chand & Company.

- ❖ **Majumdar, N.N. 1990.** Text Book of Vertebrate embryology. Tata McGraw - hill Publishing company Ltd. New Delhi.

- ❖ **McEwen, R.S., 1969.** Vertebrate Embryology. Oxford and IBH Publishing Co., New Delhi.

- ❖ **Paul, W.E.M. 1989,** Fundamental Immunology, Raven Press, New York.

- ❖ **Richard, A. Golds, Thomas I, Kindt & Barbara A. Osborne 2000** Kuby Immunology, Freeman and Co. New York.

- ❖ **Roitt. I, Brostoff, J. and Male. D. 2002.** Immunology, Mosby, New York.

- ❖ **Roitt.I.M 2000** Essential Immunology, Blackwell Scientific Publishers.

- ❖ **Verma, P.S., V.K. Agarwal and Tyagi, 1995**. Chordate embryology. S. Chand & co., New Delhi.

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CORE PAPER - 7

ANIMAL PHYSIOLOGY   [17U5ZO7]

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OBJECTIVE:

- ❖ To study the basic principles of animal Physiology, Chemical and physical properties of living matter.
- ❖ To understand the physiology of various organs and organ systems.

UNIT - I

Nutrition - Food requirements - Carbohydrates, Proteins, Fats, Minerals, and Vitamins. Digestive enzymes and their role in digestion. Gastro-Intestinal hormones & their role in digestion.   **Metabolism** - Metabolic Pathways with reference to Carbohydrates, Proteins and Fats..

UNIT - II

Respiration - Respiratory Pigments: Types, Properties and Functions. Exchange and Transport of gases- Respiratory Quotient. **Circulation**-Types of Hearts, Composition, Properties and Function of Blood - Human Cardiac Cycle-Cardiac Rhythm- Origin and conduction and regulation of Heart beat - ECG - Blood Pressure.

UNIT - III

Excretion - Types of excretory products-Structure of Kidney-Mechanism of urine formation in mammals, hormonal regulation of excretion. **Osmo-iono regulation** in fishes and mammals. **Muscles** - Types of muscles - Muscle Proteins - Mechanism of muscle contraction – Physico-chemical changes during muscle contraction- Cori cycle - Theories of muscles contraction.

UNIT - IV

Nervous tissue - Neuron - Structure, types of neurons. Nerve impulse and its conduction -Synapse-Synaptic transmission of impulses-Neurotransmitters. **Receptors**-Photoreceptor -mammalian eye - visual pigments - physiology of vision - phonoreceptors - mammalian ear- Organ of Corti - working mechanism - phonoreception in bat.

UNIT - V

Endocrine glands - structure, secretions and functions of endocrine glands of vertebrates - Pituitary, Hypothalamus, Thyroid, Parathyroid, Adrenal, Thymus, Islets of langherhans, Sex organs.

REFERENCE BOOKS:

❖ **Parameswaran, Ananthakrishnan and Anantasubramanyam, 1975.** Outlines of Animal Physiology, S. Viswanathan [Printers & Publishers] Pvt. Ltd.

❖ **Prosser,C.L. Brown, 1985,** Comparative Animal Physiology, Satish Book Enterprise, Agra - 282 003.

❖ **Sambasivaiah, Kamalakara rao and Augustine chellappa 1990.** A Text book of Animal physiology and Ecology, S. Chand & co., Ltd., New Delhi - 110 055.

❖ **William S. Hoar, 1976.** General and comparative physiology, Prentice Hall of India Pvt. Ltd., New Delhi. 110 001.

❖ **Wood.D.W, 1983,** Principles of Animal Physiology 3 Ed.,

ELECTIVE- PAPER - 1
MEDICAL LAB TECHNIQUES [17U5ZOE1]

OBJECTIVES:

- ❖ To appreciate the immense practical scope of the subject.
- ❖ To understand the laboratory practices and laboratory requirements.
- ❖ To study the procedures involved in Haematology, Bacteriology and Parasitology.
- ❖ To understand the significance of the examination of body fluids and exudates.

UNIT - I

INTRODUCTION- Scope of Clinical Laboratory Techniques. Laboratory instruments – Haemocytometer, Haemoglobinometer, and Urinometer. Cleaning, Sterilization and Disposal of infected materials. First – aid in laboratories.Microscopes – Dissection microscope, Compound microscope.

UNIT - II

HAEMATOLOGY: Blood collection and Preservation - Blood cell counting of RBC and WBC. Heamoglobin estimation, blood sugar estimation. Blood groups & Basic principles of blood transfusions.

UNIT - III

PATHOLOGY: Organisms causing infectious disease. **Virus**: Measles, Polio, Hepatatis and HIV. **Bacteria**: Tuberculosis (TB), Whooping cough, Tetanus, Diptheria and Cholera. **Protozoan:** Amoebic dysentery, Malaria and Leishmanies. **Helminthes**: Ascariasis, Filariasis and Cysticercosis.

UNIT - IV

Gastric juice analysis.

Liver function Test.

Examination of stool specimen

Examination of urine.

Examination of pus and sputum.

UNIT - V

Clinical examination, seminal fluid and Cerebrospinal fluid. Pregnancy test - Awareness and Responsibilities of Code of Ethics for Lab Technicians.

REFERENCE BOOKS:

- **Arumugam, N.** Microbiology (General and Applied). Saras Publications.

- **Dubey, R.C., and Maheswari, D.K.2007**. A teat book of Microbiology S. Chand and Co. Publ. New Delhi - India.

- **Mukherjee, 2006.:** Medical Laboratory Technology Vol. I, II & III - Tata McGraw Hill Publ.Co., Noida - India.

- **Ochei, 2000** : Medical Laboratory Science - Theory and Practice - Tata McGraw Hill Publ, Co., - Noida - India.

- **Purohit, S.S. 2005** : Microbiology - Fundamentals and Applications [6 Edition] Student Edition - Jodhpur - India.

- **Ramnik Sood, M.D.** Medical Laboratory Technology – Jaypee Brothers, Medical Publishers (p) Ltd., New Delhi.

- **Samuel, K.M. 1992** : Notes on Clinical Lab Techniques. M.K.G. Iyyer & Sons Publ. Co., Chennai - India.

SKILL BASED SUBJECT-PAPER - 3
PISCI CULTURE [17U5ZOSB]

OBJECTIVE:

To introduce basic knowledge of fish culturing methods and techniques.

UNIT - I

Scope of Aquaculture. Importance of cultivable fresh water, marine and ornamental species, maintenance of aquarium, Exotic fishes.

UNIT -II

Fish farm Maintenance - Farm management technique, water quality, temperature and accessories in farm management viz Aerator, filter, paddler.

UNIT - III

Fish culture technique: Monoculture, Polyculture and Monosex culture, Induced fish breeding, integrated fish farming.

UNIT -IV

Fish nutrition and fish feed formulation, live fish handling and transport, Seed collection-Transport of fish seeds.

UNIT - V

Fish ponds-Types-Construction of a fish pond-Management of fish farm, Prevention and control of fish diseases.

REFERENCE BOOKS:

➢ **Jhingran V.G. 1985,** Fish & Fisheries of India, Hindustan Publishing Co. New Delhi. 666p

➢ **Trivedi K.K [Ed] 1986** Fisheries Devt. 2000 AD. Association of India fisheries industries, Oxford & IBH, New Delhi 268pp.

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SKILL BASED SUBJECT

POULTRY FARMING [17U6ZOSB]

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Objective:

- ❖ To impart training on Modern Poultry Farming Technology
- ❖ To create knowledge on self employment opportunity.

UNIT-I

Introduction to poultry keeping

External morphology of variety of fowls such as Plymouth rock, light Sussex, Minorca, Rhode Island, Red and White Leghorn.

UNIT-II

Classification of fowls based on their use: meat type such as Broilers, Egg type such as white leghorn and commercial layers, Dual purpose varieties, game and ornamental purpose varieties.

UNIT-III

Feeding poultry-Management of Egg Layers- Management of Broilers in large scale farms.

UNIT-IV

Poultry diseases viral, Bacterial, fungal, Protozoan and parasitic Lice etc. Prevention and precautions during vaccination.

UNIT-V

Management of a modern poultry farms – Progressive plans to promote poultry as a self employment venture.

REFERENCE BOOKS:

- ❖ **Banarjee, G.C. 1986:** Poultry, Oxford, IBH publ. co., New Delhi,India.
- ❖ **Harbans Singh and Earl. N. Moore, 1982:** Live stock and poultry production-prentice hall IndiaPubl. Co., New Delhi,India.
- ❖ **Jull Morley, A. 1971:** Poultry Husbanry, Tata-McGraw Hill Publ. Co New Delhi,India.
- ❖ **Sastry, Thomas and Singh, 1982:** Farm Animals Management and Poultry production -Vikas Publ.co. New Delhi,India.

SEMESTER VI

CORE PAPER - 8

ENVIRONMENTAL BIOLOGY [17U6ZO8]

Objective:

❖ To realize the importance of inter relationship between every organism and environment.

❖ To study the impact of eco factors on the morphology & distribution of organisms.

UNIT - I

Scope - concept - Branches in ecology - Autecology, synecology Micro and macro environment - types of media and substratum and their influences on animals - Water: Properties, Forms of water, Soft and hard water. Air composition - properties. Substratum: Soil -Types, soil formation, soil group of India and soil profile.

UNIT - II

Biosphere - Hydrosphere - Lithosphere - Atmosphere - temperature: Distribution of temperature, thermal stratification - Temperature as a limiting factor, thermal adaptations. Light as a limiting factor. Pressure gravity, Moisture and humidity. Liebig's law minimum, Shelford's law of tolerance.

UNIT - III

Bio geo chemical cycles - gaseous cycle [N2] sedimentary cycle, [phosphates] Intra specific and inter specific animal association: colony formation, social organization, predation, parasitism, commensalism, mutualism, inter-specific competition - competitive principle or Gause's principle.

UNIT - IV

Population: Definition - characteristics - Natality, Mortality, age distribution, Population growth forms, population fluctuation. Community-Ecotone and edge effects - ecological succession. Conservation - Wild life management, Preservation - laws enforced - sanctuaries, National parks. Natural resources management: renewable and non-renewable.

UNIT - V

Pollution and Environmental degradation - deforestation, urbanization, population explosion and other environmental hazards – [depleting natural resources and relationship between poverty and environmental degradation and vice versa]. Environmental ethics and laws - Earth summits.

REFERENCE BOOKS:

- ❖ **Ananthakrishnan, T.N, and S. Viswanathan,** Principles of Animal Ecology.
- ❖ **Clark, G.L. 1954,** Elements of Eology, John wiley & Sons Inc., New York, London.
- ❖ **Eugene P. Odum, 1971**. Fundamentals of ecology, Saunders International Student Edition, W.B. Saunders Company, Philadelphia, London, Toronto.
- ❖ **Kotpal. R.L, and N.P. Bali, 1986.** Concepts of Ecology, Vishal Publications, New Delhi - 7
- ❖ **Rastogi V.B, and M.S. Jayaraji, 1988 - 1989**. Animal Ecology and Distribution of animals, Kedar nath, Ram Nath Meerut - 250 001.
- ❖ **Richard,** Manual of wild life conservation.
- ❖ **Verma, P.S and Agarwal 1986,** Environmental Biology, S. Chand & Co Ltd.

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CORE PAPER - 9
ECONOMIC ZOOLOGY [17U6ZO9]

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Objectives:

❖ To encourage young learners to take up the small scale industries

❖ To generate motivation for self-employment

❖ To disseminate information on economic aspects of Zoology.

❖ To inculcate knowledge on useful animals to Mankind

❖ To satisfy the learners with modern techniques of animal culture.

UNIT - I

Vermiculture

Methods of composting-Types of species used in Vermiculture.

Apiculture

Species of Honeybees -Honey extraction - Economics of Apiculture & management.

Sericulture

Nature and economic importance of sericulture in India.

UNIT -II

Prawn Culture

Culture techniques of fresh water prawn (*Macrobrachium rosenbergii*) & Marine water prawn (*Penaeus indicus*).

Pearl culture

Formation and nature of Pearls - Commercial importance of Pearl Culture in India.

Pisciculture

Techniques of induced breeding, commercial culture of catla & catfish, By-products of fishin and its commercial values.

UNIT - III

Poultry keeping

Morphology of different breeds of Chicken - Brooding and Rearing of Chicks- Processing of Egg, Meat and By-Products of Poultry.

UNIT - IV

Dairy farm management

Milch breeds. Draught Breeds, Dual Purpose breeds and New cross, Breeds of Cows and Buffaloes in India.

Sheep farming

Indigenous and Exotic breeds of sheep

UNIT - V

Future strategies for Livestock Development

Transgenic animal Technology - Genetic Improvement for best Breeds - Economic importance of Dairy, Leather, Wool, Fur and Pharmaceutical Industries in India.

REFERENCE BOOKS:

❖ **Ashok Kumar and Prem Mohan Nigam, 1991.** "Economic and Applied Entomology" Emkay Publication, New Delhi.

❖ **Banerjee, 1988.** A text book of Animal Husbandry - VIII- Edition - ISBN - 81- 204 - 1260 -5 Oxford & IBH Publishing co. Pvt. Ltd., New Delhi.

❖ **Banerjee, G. C. 1992**. Poultry - III - Edition - ISBN - 81 - 204 - 008 – 4. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.

❖ **Ismail, S.A1997.** Vermicology the Biology of Earth worm orient Longman, India. A. Mary Violet chrishty 2008 Vermi techonology MJP Publ. Chennai.

❖ **Jawaid Ahsan and Subhas Prasad sinha – 2000.** "A Handbook on Economic Zoolgy" - ISBN - 81 - 219- 0876 – 0,S. Chand & co., Ltd., New Delhi.

❖ **Kaushish, S.K., 2001.** Trends in livestock Research - ISBN - 81 - 7754 - 112 – 9.Agrobios [India], jodhpur - India

❖ **Keith Wilson, N.D.P., 2005.** A Handbook of Poultry Practice - ISBN - 81 - 7754 -0- 69- 6.Agrobios [India], jodhpur – India.

❖ **Major Hall, C.B. 2005.**Ponds and Fish culture - ISBN - 81 - 7754- 146 – 3.Agrobios [India], jodhpur – India.

❖ **Shammi,Q.J. and Bhatnagar, S., 2002.**"Applied Fisheries": ISBN - 81 - 7754 - 114 – 5 Agrobios [India], jodhpur – India.

❖ **Sukla, G.S. and Upadhyay, V.B., 2000**. Economic Zoology - ISBN - 81- 7133 -137 -8 Rastogi Publication, Meerut, India.

CORE PAPER – 10

EVOLUTION [17U6ZO10]

OBJECTIVES:

> ❖ To comprehend the scientific concepts of animal evolution through theories and evidences.

UNIT- I

Origin of life-Theories-creation-cosmozoic – spontaneous generation – Chemical evolution – Urey Miller experiment. Evidences favouring evolution – Comparative anatomical, vestigial organs, physiological, embryological, Biochemical.

UNIT-II

Greek thinkers – ideas of evolution before Darwin – Lamarckism and Neo-Lamarckism – Darwinism and Neo-Darwinism – Germplasm theory – Mutation Theory – Modern Synthetic theory.

UNIT-III

Geological eras – Fossils and fossilization – Dating of fossils – Extinctions - Living fossils. Adaptations – Variations & its origin – Polymorphism – Transient and stable.

UNIT-IV

Isolating mechanisms – different types – species concepts – definition of species – Origin of species – Allopatric and Sympatric speciation. Hardy Weinberg law.

UNIT-V

Mimicry & Colouration - Batesian and Mullerian. Convergent, Divergent and Parallel evolution - Co-evolution. Evolution of Man - Biological & Cultural.

REFERENCE BOOKS

❖ **Colbert, E.H. 1969 -** Evolution of vertebrates, Wiley, New york.

❖ **Dobzansky, T. 1976** - Genetics and the origin of species. Oxford and TBH Publishing Co. New Delhi.

❖ **Elic. Minkoff, 1983 -** Evolutionary Biology, Addison Wesley.

❖ **Leninger, A.L., Nelson, D.L. and Cox, M.M. (1993)** - Principles of Biochemistry, CBS Publishers and Distributors, New Delhi.

❖ **Mayr, Ernest, 1973** - Animal species and Evolution. The Belknap Press of Harvard University, Cambridge.

❖ **Sanjib Chattopadhyay . Life**, Origin, Evolution and adaption (2002) -. Books and Allied (p) Ltd.

❖ **Savage, J.M. 1976** - Evolution. Amerind Publishing Co. Pvt. Ltd. New Delhi.

❖ **Simpson, G.C. 1967** - The meaning of Evolution. Revised Edition - New Haven, Tale University Press.

CORE PRACTICAL - III [17U6ZOPR3]

ANIMAL PHYSIOLOGY, IMMUNOLOGY AND DEVELOPMENTAL BIOLOGY

A.ANIMAL PHYSIOLOGY

1. Study of human salivary amylase in relation to pH and temperature.

2. Oxygen consumption in fish with reference to its body weight.

3. Detection of nitrogenous waste products in fish tank water, bird's excreta and mammalian urine.

4. Use of Kymograph unit Sphygmomanometer, B.P. apparatus, Stethoscope. Glucometer and Haemoglobinometer.

B.IMMUNOLOGY

1. Study of Antigen-Antibody reaction-Human blood grouping (ABO and Rh)

2. Study of prepared slides of Immune Organs (Transverse section)

a) Thymus

b) Spleen

c) Bone marrow

d) Lymph node

C.DEVELOPMENTAL BIOLOGY

Study of the following prepared slides / museum specimens

1. Sections of Testis and Ovary (Mammalian)

2. Slides of Mammalian sperm and ovum.

3. Study of Egg types-Frog's egg, Hen's egg

4. Study of cleavage stages- Blastula and gastrula of frog.

5. Slides of Different stages of chick embryo-18 Hours (Primitive streak stage), 24 hours, 48 hours and 72 hours.

6. Placenta of Sheep.

CORE PRACTICAL-IV [17U6ZOPR4]

ENVIRONMENTAL BIOLOGY, ECONOMIC ZOOLOGY and BIO-TECHNOLOGY

1. ENVIRONMENTAL BIOLOGY

1. Estimation of Dissolved Oxygen, Salinity, pH, free CO_2, carbonate and Bicarbonates in water samples.

2. Use of Rain gauge, Maximum and Minimum thermometer, Hygrometer and Anemometer.

3. Plankton study – Fresh water and Marine plankton.

4. Study of natural ecosystem and field report.

2. ECONOMIC ZOOLOGY

Study of the following prepared slides / specimens

Earthworm types (any two)-(Vermiculture)

Megascolex mauritii – South Indian species – surface crawlers

Drawida modesta – Red soil with calciferous gland

Pheretima posthuma – North Indian – Large specimen

Eudrilus eugeniae-Redworm, Exotic.

Fish parasites (Lernea, Argulus)

Larvivorous fishes

Poecilia reticulata– Guppy

Gambusia affinis – Gambusi

Colisa labia –Dwarf gourami

Different stages of silk worm

Types of bees

Common Pests.

BIOTECHNOLOGY

Study of prepared slides, Models or Specimen

- ➢ Escherichia coli

- ➢ Bacteriophage T4

- ➢ Plasmid pBR322

- ➢ P.C.R , adapters and linkers-Blotting techniques: Southern, northern and western.

- ➢ Visit to Biotechnology lab and Report-Compulsory
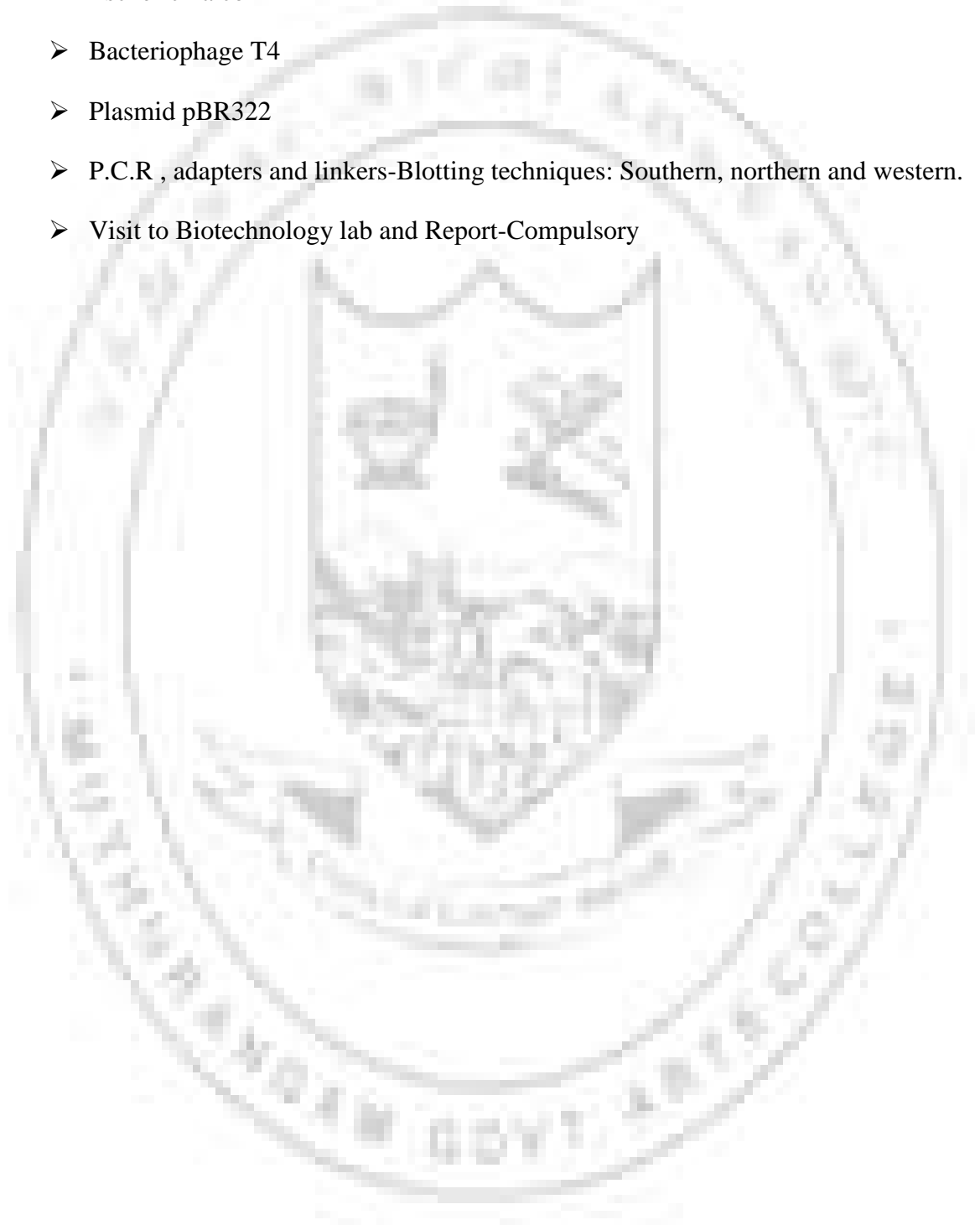
ELECTIVE PAPER-2
BIO INSTRUMENTATION [17U5ZOSB]

OBJECTIVE:

To acquire the knowledge of basic principles and applications of tools. To know the techniques for the measurement of physical, physiological, biochemical and biological factors in man and other organism.

UNIT-I

Units of measurements – Metric system, conversion of units, **Microscopy**-principles & types (simple, light, phase contrast, polarizing dark field & Electron) **Autoclave**-principles & applications and types.

UNIT-II

Centrifuge-Types, principles and Application (clinical, ultra centrifuges) - pH-Sorenson's pH scale, **pH meter**-principle and applications, **Laminar air flow**, **Incubators** and **Water bath**.

UNIT-III

Chromatrography-principles types (Paper, Thinlayer, Column) and applications; **Electrophoresis**-principles, types-paper & gel [AGE & PAGE] and applications.

UNIT-IV

Spectroscopy- principles & uses of colorimetry and **NMR** (Nuclear Magnetic Resonance) spectroscopy; **Radio isotopic technique** – Radio-immunoassay, Biochemical applications of radio isotopes.

UNIT-V

Biosensors, principle, types and applications (Environmental Biosensors & Bio-reporters) DNA & RNA sequencing methods, **PCR**-principle & application. **DNA Micro array** and its applications.

REFERENCE BOOKS:

❖ **Biophysics: Ani-introduction**, R.M.J Cottenill John Wiley & Sons Ltd., England 2002.

❖ **Gurumani.N. 2006.** Research methodology for Biological sciences MJP publ. Chennai.

❖ **H.B.Bull, F.H.Davis,** An introduction to physical Biochemistry 2nd Ed,Philadelphia 1971.

❖ **M.A.Subramanian 2005,** Biophysics (Principles and Techniques) MJP Publishers, Chennai.

❖ **Upadhyaya A, K.Upathyaya and N.Nath, (2003)** Biophysical chemistry, Principles and Techniques, 3rd Ed, Hmalaya publishing house.

❖ **Veerakumari L., 2006,** Protein sequencing in Bio informatics Bioinstrumentation, MJP publ. Chennai.

❖ **W.W.Unbriet, Z.H.Burri and Stamffier J.F.** Manometric and Biochemical techniques, 5th Ed. Burges Pub. Co. Minneapolis 1972.

ELECTIVE-PAPER - 3
MICROBIOLOGY [17U6ZOE3]

OBJECTIVES:

  ❖ To emphasize the importance of integrating new knowledge on Microorganisms.

  ❖ To update the Technology innovations of Microbial genetics and its Application.

UNIT - I

Microbiology: Scope & Application-classfication of Microorganism by nutrition. Microbial techniques, culture medium, Types of medium & culture techniques-methods of microbial growth- methods of isolating pure culture-staining and identification.

Unit-II

Bacteriology: General characteristics of bacteria– Bergey's Bacterial classification - morphology and fine structure of bacteria. Reproduction: Asexual and sexual methods.

Virology: General characteristics of viruses – classification of animal and plant viruses structure of T4 - bacteriophage virus.

UNIT - III

Epidemiology of infectious diseases with reference to man such as Bacterial [*Tuberculosis*], Viral [Hepatitis], protozoan [Amoebiasis] and Fungal [*Candida albicans*] diseases. Struture of HIV & its transmission.

UNIT - IV

Industrial Microbiology: Current developments of industrial microbiology-Stages and types of fermentation-Ethanol, Vinegar, Citric acid & lactic acid production- Microbial production of enzymes, Vaccine & hormones.

UNIT - V

Agricultural Microbiology: Role of microorganisms in soil formation & Soil fertility-Nitrogen fixing bacteria & phosphobacteria, Microbial herbicides, bacterial insecticide-Pseudomonas & Viral insecticide.

REFERENCE BOOKS:

- ❖ **Agarwal, A.K 2008:** Industrial Microbiology, AgrobiosPubl.India.

- ❖ **Bohra, A.2006:** Food Microbiology, Agrobios Publ. India.

- ❖ **Dubey.,R.C.and D.K.Maheswari, 2006.** A Text book of Microbiology, S.Chand Publishers.

- ❖ **Mani, A., Selvaraj, A.M, Narayanan, L.M & Arumugam, N. 1996**. Microbiology - saras publicagtions - Nagercoil - India.

- ❖ **Meenakumari, S.** Microbial Physiology, MJB-Publ. - Chennai, India.

- ❖ **Michael J. Pelzar, 2005.** Elements of Microbiology. International student edition.TATA McGraw-hill publication.

- ❖ **Mosharaffudin, Ahmed & Basumatary 2006.** Applied Microbiology - MJP Publ. India.

- ❖ Parihar, L. 2008: Advances in Applied Microbiology - Agrobios Publ. India.

- ❖ Power and Daginawala, 2005. General Microbiology, Himalaya Publishing House.

- ❖ Prescott & Donald, 2003, Microbiology 5th Edition. Mc Graw Hill publishing House.

- ❖ Prescott, 2009: Industrial Microbiology - Agrobios Publ. India.

- ❖ Purohit, S.S.2007: Microbiology - Agrobios Publ. India.

- ❖ Purushotam Kaushik, 2005. Microbiology - S.Chand & Co., New Delhi, India.

- ❖ Rajan,S 2007. Medical Microbiology - MJP.Publ. Chennai, India.

- ❖ Roger Y.Stanier., 1988. General Microbiology, 5th edition, Mac Millan Edn. Ltd.,

- ❖ Sharma,P.D 1998. Microbiology - Rastogi Publ. Meerut, India.

- ❖ Subba Rao, N.S, 1999. Soil Microbiology, Oxford IBH Co. New Delhi, India.

- ❖ Sullia, S.B. & Santharam, S. 2004. GeneralMicrobiology, Oxford IBH, India.

- ❖ Tortora, Funke and Case 2004. Microbiology An Introduction. 8th edition.

- ❖ Trivedi, P.C.2008: Applied Microbiology - Agrobios Publ. India.

- ❖ Vijaya Ramesh, 2005. Environmental Microbiology, MJP.publ, Chennai, India.

- ❖ Vijaya Ramesh, 2007: Food Microbiology, MJP.Publ. Chennai, India.

ALLIED ZOOLOGY-(FOR CHEMISTRY MAJOR)
PAPER-I SYSTEMATIC ZOOLOGY [17U1AZO1]
SEMESTER-I

Marks: 75

OBJECTIVES:

To study the systems and functional morphology of Invertebrates and Chordates.

Unit-I	Morphology and life history of **Plasmodium vivax, Obelia geniculata** and **Taenia solium**
Unit-II	**Leech:** Morphology, Digestive system & parasitic adaptations of Leech. **Cockroach:** Morphology, Mouth parts-Digestive system and Nervous system. **Freshwater Mussel:** Morphology, Digestive system, Respiratory System, Glochidium Larva.
Unit-III	**Sea Star:** Morphology, Digestive system, Water vascular system and Bipinnaria larva **Amphioxus:** Morphology, Digestive system, circulatory system **Shark:** Morphology, Respiratory System, Circulatory system, Yolksac placenta
Unit-IV	**Frog:** Morphology, Digestive System, Respiratory System, circulatory system, Brain **Calotes:** Morphology, circulatory system, Urinogenital system.
Unit-V	**Pigeon:** Morphology & Respiratory system, Flight adaptations **Rabbit:** Morphology, Dentition, Digestive system, structure & function of heart.

REFERENCE BOOKS:

1. **Ekambranatha Ayyar, M and Anantha Krishnan, T.N.** "Manual of Zoology, Volume I & II Viswanathan Printers and Publishers, Chennai

2. **Jordon, E.L, and Verma, P.S. "Invertebrate Zoology**". Chand & Co, Ltd, New Delhi.

3. **Yung, J.Z.,** "Life of Vertebrates", Cambridge Uni. Press.

4. **Arumugham. N.,** "Invertebrate Zoology" Vol. I Saras publication.

5. P.S.Dhami and J.K.Dhami-Invertebrate Zoology, "S.Chand & Co, New Delhli.

6. Dr.(Tmt)Bernes Anandharaj "tpy';fpay; Jizg;ghlk;" Vol. I Cresolite Publications.

7. Arumugam, N., "Chordate Zoology" Vol.2. Saras Publication.

ALLIED ZOOLOGY –(FOR CHEMISTRY MAJOR)

PAPER-II GENERAL ZOOLOGY (17U2AZO2)

SEMESTER-II

Marks: 75

OBJECTIVES:

To study the principles of Cell Biology, Genetics, Human Physiology, Developmental Biology, Biotechnology and Medical Microbiology.

Unit-I	**CELL-BIOLOGY & GENETICS:** Cell-Biology: Ultra-Structure of a typical Animal cell-structure and function of Mitochondria, Lysomome and Nucleus. Genetics: Structure of DNA, the genetic material – Human genetic disorders-(Phenylketonuria, Alkaptonuria and Albinisim) Sex determination in Man. X and Y – linked inheritance in man.
Unit II	**HUMAN PHYSIOLOGY:** Respiration-Respiratory pigments-Role of Respiratory pigments in Transport of Gases. Excretion-Types of Excretory products-Ornithine cycle, kidney failure and Transplantation. Diseases of circulatory system: Blood pressure, Coronary heart disease, Rheumatic heart disease, Cerebral thrombosis.
Unit III	**DEVELOPMENTAL BIOLOGY:** Human: Spermatogenesis, Ogenesis, Fertilization. Twin-types Cleavage and Gastrulation in Frog.
Unit IV	**BIO-TECHNOLOGY:** Scope and Application of Biotechnology in Human health/Medicine. Application of Biotechnology in Agriculture-Biological waste treatment.
Unit V	**MEDICAL MICROBIOLOGY:** Introduction to medical microbiology – study of some common bacterial diseases (Diptheria, Tuberculosis) and Viral diseases (AIDS and Rabies) and Protozoan diseases (amoebiosis and malaria) their control measures.

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REFERENCE BOOKS:

1. Verma P.S. and Agarwal "Cell and Molecular Biology" Chand & Co, New Delhi.

2. Rev.Fr.Dr.S.Ignacimuthu, S.J."Basic Biotechnology" Tata mcGraw Hill Publishing Co.,

3. Dr.(TMT) Bernes Anandaraj "tpy';fpay; Jizg;ghlk;"- Vol. II Cresolite publication.

4. Dr.K.Vijayaraman, Dr.S.Chellammal & Tmt.P.Manikili "caph; bjhHpy; El;gk;"- Chimeera Publications, Trichy.

5. R.Ananthanarayanan, "Introduction to MEDICAL MICROBIOLOGY"-Orient Longman.

6. R.A. Agarwal, Anil K. Srivastava, Kaushal Kumar, Text Book of Physiology & Biochemistry. S.Chand & Co.

ALLIED ZOOLOGY PRACTICAL-I 17U2AZOP

SEMESTER-II

MAJOR PRACTICAL:

Model/Chart/Dissection-Anatomical observation and comments

➢ Cockroach – Digestive system & Nervous system

➢ Frog – Digestive system, Urino genital system

MINOR PRACTICAL:

Slide / Model / Chart / Mounting and comments:

Identification, Draw & Label

➢ Earthworm-Body setae.

➢ Mouth parts of cockroach, mosquito, honey bee

➢ Shark-Placoid scale

➢ Frog-brain (Dorsal & Ventral View)

SPOTTERS:

Spotters may be selected from available mounted slides, museum specimen and apparatus pertaining to the syllabus.

COMPONENTS OF INTERNAL ASSESSMENT (PRACTICAL)

Practical Assessment Exam = 30 Marks   Maximum=40 Marks

Practical Observation Note = 10 Marks

QUESTION PATTERN FOR PRACTICALS – EXTERNAL

PRACTICAL – I [17U2ZOPR1]

INVERTEBRATA AND CHORDATA

TIME: 3 hrs   Max. Marks: 60

1. Major Practical INVERT. -10

                 CHOR.-15   :   25

2. Minor Practical   :   10

3. Spotters (5x3=15)   :   15

4. Record   :   10

PRACTICAL – II [17U4ZOPR2]

CELL AND MOLECULAR BILOGY AND GENETICS

Time: 3 Hrs.   Max Marks: 60

                                        Marks

1. Major (Cell Biology Exp.)   :   25

2. Minor (Microscopic Preparation) :   10

3. Spotters (5x3) Cell Bio 3 ⎫
                              ⎬
         Genetics 2 ⎭   :   15

4. Record   :   10

PRACTICAL – III [17U6ZOPR3]

ANIMAL PHYSIOLOGY, DEVELOPMENTAL BIOLOGY AND IMMUNOLOGY

Time: 3 hrs   Maximum: 60 Marks

1. Physiology Expt.   :   25

2. Developmental Biology   :   10

   X and Y (Spotters) 2×5=

3. Spotters (5x3)

   Dev.Biology-2

   Immunology-2   :   15

   Physiology-1

4. Record   :   10

PRACTICAL – IV [17U6ZOPR4]

ENVIRONMENTAL BIOLOGY, ECONOMIC ZOOLOGY & BIOTECHNOLOGY

Time: 3 Hrs.   Max.: 60 Marks

Marks

1. Envt. Bio. Expt.   :   25
2. Envt. Bio (Minor)   :   10
   X and Y   X-any one appliance
                  Y-adaptation in relation to habitat
3. Spotters (5x3)
   Eco.Zoogy   -3   :   15
   Biotechnology -2
4. Record   :   10

ALLIED PRACTICAL – II [17U4AZOPR]

ECONOMIC ENTOMOLOGY AND PEST MANAGEMENT

(for Zoology Major Students)

Time: 3 Hrs   **Max. 60 Marks**

1. Major Practical a) 15 (Life cycle) ⎫   25
                    b) 10 (Appliances) ⎬

2.   Minor Practical   :   10

3. Spotters (5×2)   :   10

4. Insect Box   :   5

5. Record   :   10

ALLIED ZOOLOGY PRACTICAL [17U2AZOPR]

(for Chemistry Major Students)

Time: 3 Hrs.   **Max: 60 Marks**

1. Major Practical a. Invertebrata   10 ⎫
                                          ⎬ :   25
              b. Chordata   15 ⎭

2. Minor Practical   :   10

3. Spotters (5×3)   :   15

4. Record   :   10

QUESTION PATTERN FOR CORE, ALLIED, ENVIRONMENTAL STUDIES, VALUE EDUCATION, SKILL BASED, NON MAJOR AND ELECTIVE PAPERS

COMPONENTS OF INTERNAL ASSESSMENT (THEORY)

Maximum: 25 Marks

ASSESSMENT EXAM   :   20 Marks

ASSIGNMENT   :   5 Marks

COMPONENTS OF INTERNAL ASSESSMENT (PRACTICAL)

ASSESMENT EXAM   :   30 Marks   Maximum: 40 Marks

OBSERVATION Note   :   10 Marks

QUESTION PAPER PATTERN (THEORY-EXTERNAL)

Time: 3 Hrs.   Maximum: 75 Marks

SECTION-A

Answer all questions.

Two questions from each unit   10x2=20 Marks

SECTINO – B

Answer all questions (Either or Pattern)   5x5=25 Marks

Two questions form each unit.

SECTION-C

Answer any three questions   3x10=30 Marks

Five questions without omitting any unit.

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2

MASTER OF SCIENCE

DEGREE COURSE

M.Sc. ZOOLOGY

UNDER CBCS

(with effect from 2017-2018)

The Course of Study and the Scheme of Examinations

S. NO	Study Components / Course Title		Ins. hrs/ Week	Credit	Title of the paper	Maximum Marks		
						CIA	Uni.Exam	Marks
SEMESTER I						CIA	Uni.Exam	Marks
1	MAIN	Paper-1	5	4	Life and diversity of invertebrates	25	75	100
2	MAIN	Paper-2	5	4	Life and diversity of Chordates	25	75	100
3	MAIN	Paper-3	5	4	Cell and molecular Biology	25	75	100
3	MAIN PRACTICAL	Paper 1	12	-	Life and Diversity of Invertebrates Chordates Cell and molecular Biology	-	-	-
4	ELECTIVE (**a**)Disciplinary **or** Elective (**b**)inter Disciplinary	Paper-1	3	3	(A)Aquaculture and Farm Management (B)Biostatistics and Bioinformatics	25	75	100
			30	15		100	300	400
SEMESTER II						CIA	Uni.Exam	Marks
5	MAIN	Paper-4	4	4	Genetics	25	75	100
6	MAIN	Paper-5	4	4	Environmental Biology	25	75	100
7	MAIN	Paper-6	4	4	Bio Technology	25	75	100
8	MAIN PRACTICAL	Paper-1	-	5	Life and Diversity of Invertebrates Chordates and Cell and molecular Biology	25	75	100

9	MAIN PRACTICAL	Paper-2	10	5	Genetics, Environmental Biology and Biotechnology	25	75	100
10	ELECTIVE (**a**)Disciplinary **or** Elective (**b**)inter Disciplinary	Paper-2	3	3	(A)Endocrinology (B) Biochemistry	25	75	100
11	Compulsory Paper		2	2	**Human Rights**	25	75	100
12	**Elective** Practical Respective Practical of the Elective Chosen	Paper 1	3	3	(a) Endocrinology or (b)Biochemistry	25	75	100
			30	**30**		**200**	**600**	**800**
SEMESTER III						**CIA**	**Uni. Exam**	**Marks**
13	MAIN	Paper-7	5	4	Animal Physiology	25	75	100
14	MAIN	Paper-8	5	4	Developmental Biology	25	75	100
15	MAIN	Paper-9	5	4	Immunology	25	75	100
16	MAIN PRACTICAL	Paper-3	12	-	Animal Physiology Developmental Biology and Immunology	-	-	
17	ELECTIVE (**a**)Disciplinary **or** Elective(**b**)inter Disciplinary	Paper-3	3	3	(A) Fisheries Science (or) (B) Biophysics	25	75	100
			30	**15**		**100**	**300**	**400**
SEMESTER IV						**CIA**	**Uni.Exam**	**Marks**
19	MAIN	Paper-10	5	5	Research Methodology	25	75	100
20	MAIN	PROJECT (OR)	5	4	Project / Dissertation with Viva Voce	25	75	100
		Paper-11	5	4	Evolution	25	75	100
21	MAIN	Paper-12	5	5	Entomology	25	75	100
					Animal Physiology			

22	MAIN	Practical 3	-	5	Developmental Biology and Immunology	25	75	100
23	MAIN	Practical 4	9	5	Research Methodology Evolution and Entomology	25	75	100
24	Elective (a) Disciplinary **or** Elective(b) inter Disciplinary	Paper 4	3	3	(A) Sericulture (or) (B) Microbiology	25	75	100
25	**Elective** Practical (Respective Practical of the Elective Chosen)	Paper-2	3	3	(a) Sericulture (or) (b)Microbiology	25	75	100
			30	30		200	600	800

* **For those not choosing Project / Dissertation with *viva voce,***
Main Paper 11 Evolution is compulsory

Subject	Papers	Credit	Total Credits	Marks	Total marks
MAIN	12	4-5	50	100	1200
MAIN PRACTICAL	4	5-6	20	400	400
ELECTIVE	4	3	12	100	400
ELECTIVE PRACTICAL	2	3	6	100	200
COMPULSORY PAPER	1	2	2	100	100
Total	**23**	-	**90**	-	**2300**

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2

M.Sc. ZOOLOGY

SYLLABUS

UNDER CBCS

(with effect from 2017-2018)

SEMESTER I

PAPER-1
LIFE AND DIVERSITY OF INVERTEBRATES

OBJECTIVES

To comprehend the systematic position, functional morphology, mode of life, affinities and biodiversity of invertebrates.

UNIT-I

Broad classification of the Animal Kingdom – Concepts of species, hierarchial taxonomy.

Protozoa

Feeding, Reproduction and Parasitic adaptations with suitable examples.

Economic importance of Protozoa

Theories on Origin and evolution of Metazoa.

Porifera

Functional morphology of freshwater sponges with suitable examples.

Marine sponges.

Reproduction in sponges.

Skeleton in sponges.

UNIT-II

Coelenterata

Origin and evolution, Polymorphism and Reproduction.

Corals and Coral reeves

Helminthes

Functional morphology and adaptations for parasitic mode of life. Helminthes in human diseases.

UNIT-III

Annelida

Archiannelida. Interelationship between different classes of Annelida. Origin and evolution of coelom. Adaptive radiation in Annelida.

Arthropoda

Xiphosura-structure and affinities. Larval forms in crustaceans. Economic importance of Crustaceans. Phylogeny of Arthropoda,

UNIT-IV

Mollusca

Torsion in Gastropoda - Adaptive radiation in Mollusca. Phylogeny of Mollusca,

Echinodermata

Origin and evolutionary significance of Echinoderm larvae.

UNIT-V

Minor Phyla

Structural peculiarities and affinities of, Nemertinea, Rotifera, Pogonophora, Phoronida.

Invertebrate fossils: Trilobites, Brachiopoda, Cephalopoda and Echinodermata.

REFERENCE BOOKS

1. Barnes. R.D. 1974 Invertebrate Zoology. W.B. Saunders Co.,Philadelphia.

2. Hyman L.H. 1951 The Invertebrata, Vol I to VI. Mc Graw – Hill Book Co., New York.

3. Carter, G.S.A. 1969. General Zoology of Invertebrates. Sidewick and Jackson Ltd., London.

4. Borradile, L.A. Eastham, L.E.S. and J.T. Saunders. 1977 The Invertebrate Cambridge University Press.

5. Barrington, E.J. W. 1969. Invertebrate Structure and Functions. English Language Book Society.

6. Moore, R.C. Lalicker, C.G. and Fisher, A.G. 1952 Invertebrate Fossils. Mc Graw Hill Book Co., New York

7. Gardinar, M.S. 1972 Biology of the Invertebrates, McGraw - Hill Book Co., New York.

PAPER-2

LIFE AND DIVERSITY OF CHORDATES

OBJECTIVES

To comprehend the systematic position, functional morphology, mode of life, affinities and biodiversity of chordates.

UNIT-I: TAXONOMY

Principles of taxonomy

Nomenclature- Binomial, Trinomial nomenclature.

Suffix as for super family name-(oidea), familyname (idea), use of suffixes 'i', 'orum', 'ae', 'arum', 'ensis' and 'iensis'.

Tautonyms synonyms and Homonyms.

New trends in taxonomy: Ecological approach, Ethological approach, Cytological approach, Biochemical approach and Numerical taxonomy.

Taxonomic key: Indented, Simple non-Bracket Grouped type, combination

Pictorial: Branching type, Circular and Box-type.

UNIT-II

Prochordate: Systematic position and phylogeny of Prochordates.

Ostracoderms: Silurian and Devonian Ostracoderms. Evolutionary position of the Ostracoderms.

Placoderms: Origin of Jaws- Structural peculiarities of Cyclostomata.

UNIT-III

Chondrichthyes: Fossil history of chondrichthyes, tendencies in Elasmobranch evolution.

Actinopterygii: Origin and evolution, Adaptive radiation of bony fishes.

Amphibia: Origin and evolution of Amphibia.

UNIT-IV

Reptilia: Evolution of Reptilia. Saurischian and Ornithischian Dinosaurs - Rhyncocephalia - Adaptive radiation of Reptiles.

Aves: Birds as glorified reptiles. Fossil history of birds. Palate in Birds. Adaptive radiation in birds.

Mammal: Evolution of Mammals, Structural peculiarities of Prototheria, Metatheria and Eutheria.

UNIT-V

Comparative anatomy: Origin and evolution of the vertebrate integumentary system. Paired fins and limbs, heart and aortic arches and brain of vertebrates.

REFERENCE BOOKS

1. Waterman. A.J. 1971. Chordate Structure and Function. McMillan Co. London.

2. Jolie, M. 1968. Chordate Morphology. East West Press. Pvt, Ltd,

3. Romer, A.S. and Parson, T.S. 1978 Vertebrate Body. W.B. Saunders Co.,Philaelphia.

4. Young, J.2.1969. Life of Vertebrates. Clarendon Press, Oxford.

5. Colbert, E.H. 1969. Evolution of Vertebrates. John Wiley and Sons Inc, New York.

6. Holstead. 1969 The Pattern of Vertebrate Evolution. Freeman and Co. San Francisco. U.S.A.

7. Hobart M. Smith, 1960 Evolution of Chordate Structure, Holt, Rinehart and Winston. Inc. New York.

8. Kapoor, V.C. 1998 Theory and Practice of Animal Taxonomy. Oxford and IBH Publishing Co., Pvt, Ltd. New Delhi.

9. Hyman, L.H. 1966. Comparative Vertebrate Anatomy. The University of Chicago Press, Chicago.

PAPER-3

CELL AND MOLECULAR BIOLOGY

OBJECTIVES

To understand the structure and molecular basis of cellular interactions, energy transformation, regulation and control of genes, cell cycle and information transfer.

UNIT-I: STRUCTURE AND FUNCTIONS OF CELL ORGANELLES

Plasma membrane: Structure, Membrane receptors, Membrane transport - Membrane Potentials – cell adhesion, intercellular recognition - Intercellular junctions.
Endoplasmic reticulum-intracellular transport

Mitochondria - Energetics - Cellular respiration - mitochondrial replication.

UNIT-II: NUCLEUS

Cytoplasmic interactions. Nuclear receptors, Cell fusion: homokaryons, heterokaryons.

Structure and function of Chromatin- Euchromatin and heterochromatin - Polytene and lambrush Chromosomes

UNIT-III: CELL CYCLES AND CANCER CELL

Cell cycles - its components G_O-G_1 transition - Spindle organization - Chromosome movements - Regulation and synchronization of cell division.

Cancer cell: Differences between normal and cancer cell- structural and functional characteristics -Tumour Viruses-Oncogenes - Environmental factors inducting cancer. Hormones in relation to cancer-Theories of carcinogeneis.

UNIT-IV: CHEMISTRY OF NUCLEIC ACIDS

Chemistry of DNA - Polymorphism of DNA - Mechanism and enzymology of DNA replication - DNA repair.

Chemistry of RNA - Different types of RNA and their functions.

UNIT-V: INFORMATION TRANSFER

Information transfer in Prokaryotes AND Eukaryotes. Transcription - Promotors - Initiators and terminators – Post Translation modifications- post transcriptional modifications. Trimming of introns and splicing of exons. RNA processing

REFERENCE BOOKS

1. De Robertis. E.D.F. and De Robertis. E.M.F. 2001. Cells and Molecular Biology, B.I Publications Pvt Ltd, India.
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7. Korenberg. A. 1974. DNA Replication. Dorothy- W.H. Freeman and Company, San Francisco.
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9. Shanmugam, G., 1988. A laboratory manipulation in fish. Madurai Kamaraj University.
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ELECTIVE

PAPER-1

(to choose either A or B)

A. AQUACULTURE AND FARM MANAGEMENT

Objectives

The objective of the paper is to understand the culture practices of both fin fish and shell fishes in India and World. This paper is planned to teach in the lines of knowing the candidate species of important fin and shell fishes. Gaining knowledge in the food and feeding habits, investigating the seed production and farm management and method of farming. And this paper also to provide scope for employment opportunities in aquaculture activities.

UNIT-I: Introduction to Aquaculture

Importance of aquaculture, Global scenario, Present status in India - Prospects and scope.

Aquaculture Farms

Site selection, topography, water availability and supply, soil conditions and quality. Design and layout, structure and construction.

UNIT II: Biology of important cultivable species and their economics

Standard guidance for choosing cultivable species - Seaweeds, Crustaceans (Prawns & Lobsters), Molluses (Clams, Cockles, Mussels and Oysters) and fishes-biological criteria - Environmental adaptability and compatibility - Economic importance - economics, market values, by-products and availability in adjacent region.

UNIT-III: Survey of seed Resources and Seed & Feed Production

Distribution and abundance of natural seed resources, collection methods and segregation.

Artificial seed production - breeding under controlled condition, induced breeding technique, larval rearing, packing and transportation.

Live feed - Microalgae, Rotifer and Artemia - their culture. Feed formulation - Conventional and non-conventional ingredients, feed additives, feed attractants and feed formulations.

UNIT-IV: Culture systems

Traditional, Extensive , Semi-intensive and intensive systems, composite fish culture, paddy-cum-fish culture, integrated fish culture, sewage water fish culture, raceway culture, cage, pen and rack culture. Culture system management - pond preparation, production and economics-employment opportunities in aquaculture.

UNIT-V: Farm Management

Water quality management - temperature, salinity, pH, O_2, CO_2 levels, nutrients and trace elements.

Control of parasites, predators, weeds and diseases in culture ponds.

Disease diagnosis - ELISA, Western blotting - DNA based diagnosis of diseases and fish vaccines.

REFERENCE BOOKS

1. Balugut, E.A.1989. Aquaculture system and practices. A selected review publishing House, New Delhi.
2. Dash, M.C. and Patnik, P.N.1994. Brackish water culture. Palani Paramount publications, Palani.
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4. Paul Raj, S. 1995. Shrimp Farming techniques, Problems and solutions. Plani Paramount Publications, Palani.

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6. Pillay, T.V.R. 1990 Aquaculture Principles and Practices. Blackwell Scientific Publications Ltd.

7. Ponnuchammy, R.1997. Practical Guide to shrimp farming. Palani Paramount Publications,palani.

8. Post, G.M. 1983. Text Book of Fish Health. TFH Publication.

9. Sinha, V.R.P. and Srinivastava, H.C. 1991. Aquaculture Productivity. Oxford and IBH Publications Co., Ltd., New Delhi.

PAPER-1

B. BIOSTATISTICS AND BIOINFORMATICS

OBJECTIVES

- ❖ To understand the basic concepts of biostatistics and bioinformatics.
- ❖ To solve biological problems through computational management.

UNIT-I: INFERFTIAL STATISTICS

Introduction: Definition of statistical population and sample in biological studies. Variables: qualitative and quantitative, Discrete and continuous.

Probability; Basic principles - apriori and aposteriori probabilities - addition and multiplication rules of probability. Conditional probability. Theoretical distribution, normal binomial and Poisson - application (computation required).

UNIT-II

Hypothesis testing - Null hypothesis - levels of significance - degrees of freedom - type I and type II errors.

Test of significance: Chi-square test for goodness of fit, homogeneity and association between attributes (Problem relating to Genetics, patterns of distribution etc. to be worked out.

Test of significance for large and small samples - comparison of sample mean with population mean comparison of two - sample (computation required)

UNIT-III: CORRELATION AND REGRESSION

Correlation: definition and types - simple, multiple -partial, linear, nonlinear, mutual, cause and effect etc.

Uses of scatter diagram and correlation graph in the study of correlation between two variables. Computation of Karl Pearson's co-efficient of correlation - testing its significance, Interpretation.

Regression analysis, derivation of regression equation between two variable regression coefficient - construction of regression lines - properties - application. ANOVA

Population Statistics -Vital statistics - natality and morality rates. Population estimation - population growth.

UNIT-IV: BASIC BIOINFORMATICS

Bioinformatics - Biological /Specialized Database - Servers for Bioinformatics (NCBI, EBI, Genoment) Virtual Library - Data mining - Data Warehousing - Searching techniques - Genomics - Proteomics.

UNIT-V: ALGORITHM IN BIOINFORMATICS

Algorithm and tools sequence analysis - Similarity Search - Genetic algorithm - Gene finding - Protein prediction - Biomolecular visualization - Phylogenetic analysis - Drug designing.

REFERENCE BOOKS

1. Milton, J.S 1992 Statistical Methods in Biological and Health Science. McGraw-Hill Inc, New York.
2. Schefler, W.C. 1963 Statistics for biological sciences. Addition - Wesely Publication Co., London.
3. Snedecor, G. Wand Cocham, W. G. 1967 Statistical Methods. Oxford Publication Co., New Delhi.
4. Spiegel, M.R. 1981 Theory and problems of statistics, Schaum's Outline Series McGraw -Hill International Book Co., Singapore.
5. Pillai, R.S.N. and Bagawathi, V.2005 Statistics. S. Chand & Co.Ltd, New Delhi.
6. Stansfield,W.O. 1984 Theory and Problems of genetics(including 600 problem) Schaum's outline series.McGraw - Hill Book, Co., New York.

7. Sokal,R.R.and Rohlf, F .J 1969 Biometry.The Principles and Practice of Statistics in Biological Research.W.H.Freman and Co.,San Francisco.

8. Mahajan, B.K. 1984. Methods in Biostatistics for Medical students and researchWorkers. Smt. Indu Mahajan, New Delhi.

9. Gupta, S.P. 1988. An easy approach to statistics. Chand & Co., New Delhi.

10. Westhead, D.R., Parish, J.H. and Tugman, R.M. 2003 Bioinformatics. Viva Books Pvt. Ltd., New Delhi

11. Arthur, M.L. 2003. Introduction to Bioinformatics Oxford University Press, New Delhi.

12. Higggins D.and Taylor, W. 2000 Bioinformatics: Sequence, Structure and Databanks. Oxford University Press, New Delhi.

13. Durbin, R., Eddy, S.R., Krogh, A. and Mitchison, G. 1998. Biological sequence Analysis.Cambridge University Press, Cambridge, U.K.

14. Baxevanis, A. and Ouellette, B.F. 1998. Bioinformatics: A practical guide to the analysis of genes and proteins. Wiley Interscience, Hoboken, New Jersey, USA.

15. Arthur M. Lesk. 2006. Introduction to Protein structure. Oxford University Press, New Delhi.

SEMESTER II

PAPER-4

GENETICS

OBJECTIVES

- ❖ To understand the fine structure of genetic materials and regulation of their action.
- ❖ To know the chromosomal basis of genetic disorders, development and differentiation.
- ❖ Also, to acquire the knowledge of the importance of population genetics and nuances of genetic engineering and applied genetics.

UNIT-I: MOLECULAR STRUCTURE OF GENETIC MATERIAL

Molecular structure of DNA and RNA – Replication of DNA and RNA-theories, Gene concept - One gene one polypeptide concept.

Identification of DNA and RNA as the genetic material.

Microbial Genetics - Conjugation, transformation and transduction and Sexduction.

Chromosome mapping in prokaryotes (Virus, Bacteria) and eukaryotes (Neurospora and Man)

UNIT-II: REGULATION OF GENE ACTION

Enzyme regulation of gene action. Gene regulation of gene action - Operon concept - GAL and LAC Operon system. Evidence of regulation of gene action.

Genes and metabolism. Inborn errors of metabolism in Man (With reference to protein, carbohydrates, Lipid and nucleic acid).

UNIT-III: CHROMOSOME AND GENETICS DISORDERS

Sex chromosomes. Dosage compensation - X inactivation. Geneomic imprinting.

Human Genetics: Variations in karotypes (autosomal and sex chromosomal) with special reference to klinfelters,Turners and Down's syndromes in man. Genetic counselling - Objectives, ethics and principles.

UNIT-IV: GENES IN DEVELOPMENT, RADIATION GENETICS AND POPULATION GENETICS

Genes in development and differentiation Mechansim of chromosomal breakage - physical chemical and biological factors or agents. Mutagens and mutagenesis and carcinogenesis - genetic changes in Neoplasia in man

Population genetics:

Population and gene pool. Hardy Weinberg Law-Genetic equilibrium.

Calculation of gene frequencies for Autosomal (Complete dominance, codominance and multiple alleles) and sex linked genes. Factors affecting Hardy Weinberg equilibrium.

UNIT-V: GENETIC ENGINEERING AND APPLIED GENETICS

Genetic Engineering - Restrictive enzymes - Recombinant DNA techniques. Applications of Recombinant DNA technology.

Applied Genetics - Application of genetics in animal breeding. Application of genetics in Crime and Law - DNA fingerprinting, Genetic basis of intelligence. Studies on Twins.

REFERENCE BOOKS

1. Watson. J.D. Hopkins, N.H.., Roberts, J.W., Steitz, J.A. and Weiner, A.M. 1987 Molecular Biology of the Gene. W.A. Benjamin/Cummings Co., New York.
2. Sinnot. E.W., Dunn. L.C., Dobzhansky, T.H. 1973. Principles of Genetics. McGraw Hill Co., New Delhi.
3. Daniel L. Hartl. 1994. Geneties. Jones and Barflaff Publishing, Boston.
4. Lewin, B. 2000. Genes VII. Oxford University Press, New York.

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5. Ayala, F. I. and Kieger, J.A. Jr., 1980, Modern Genetics. The Benjamin Publishing Co. London,

6. Goodenough, U. 1984. Genetics. Saundes College Publishing Co., London.

7. Curs Sten 1973 Principles of Human Genetics. W.H. Freeman and Co., New York.

8. Jenking, J.B. 1983. Human Geneties. The Benjamin Cummings Publishing& Co., Londan.

9. Market, C.L. & Ursprung, 1973. Development Genetics, Prentice Hall.

10. Gardner E.J. Simmons, M.J. and Snustad, D.P.1991 John Wiley & Sons, New York.

11. Tamarin, R.H. 1996. Princples of Geneties, WCB Publishers Munro.

12. Stickberger, M.W. 1985. Genetics. Printice - Hall of India, Pvt. Ltd., New Delhi.

13. Pandian, T.J. and Muthukrishnan, J. 1988. Workshop on Research Methods for Chormosomal Manipulation in Fish. Department of Biotechnology Govt. of India, New Delhi.

14. Pandian, T.J. and Muthukrishnan, J. 1990. Research Methods for Gene and Choromosome Manipalation in Fish. Department of Biotechnology, Govt. of India, New Delhi.

PAPER-5

ENVIRONMENTAL BIOLOGY

OBJECTIVES

- ❖ To generate up-to-date knowledge on environmental conservation and management.
- ❖ To understand the components of ecosystem, habitat ecology and resource ecology, biogeochemical cycle.
- ❖ To create awareness on pollution and its management.

UNIT-I: ECOSYSTEM AND COMMUNITY

Review of concept of ecosystem - Natural and Man-made ecosystem, with examples. Biomass-Energy flow - Trophic structure and levels - Pyramids, food chain and web - ecological efficiencies, and productivity and its measurement.

Definition, nature and flux of energy through communities. Influence of competition, predation. Community succession - homeostasis.

UNIT-II: HABITAT AND POPULATION
Habitat- Definition-Physico-chemical features of Terrestrial and aquatic habitats

Biomass, Adaptations with reference to physico - chemical features of environment of coastal ecosystems.

Renewable and non - renewable resources - animal resources. Conventional and non - conventional energy sources.

UNIT-II: POPULATION AND BIOLOGICAL CYCLES

Structure and distribution - Growth curves - Groups, natality, Mortality - Density indices, Life study tables - factors affecting population growth - Carrying capacity. Population regulation and human population control.

Complete and incomplete biogeochemical cycles - Sedimentary cycle - Recycle pathway of elements - Cycling of non - essential and organic nutrients.

UNIT-IV: ENVIRONMENTAL CONSERVATION AND MANAGEMENT

Principles of conservation - Rain water harvesting - Soil health and fauna inputs in agriculture Biosphere reserves - wildlife conservation and management. Biodiversity - Germplasm conservation and cryopreservation. Social forestry - tribal welfare.

UNIT-V: POLLUTION AND MANAGEMENT

Environmental pollution and its biological effects. Air, water, soil and noise pollution. Biological indicators and their role in environmental monitoring.

REFERENCE BOOKS

1. Odum. E.P. 1996 Fundamentals of Ecology. Nataraj Publishers, Dehra Dun.

2. Trivedi, P.R.and Gurdeepraj, K. 1992. Environmental Biology. Akashdeep Publishing House New Delhi

3. Berwer. A.1988 .The Science of ecology. Saunder's college publishing.

4. Bandopadhyay, J.1985. India's Environment Crisis and response. Nataraj Publishers,Dehra Dun.

5. Smith, R.L.1986. Elements of Ecology. Harpet and Row Publishers, New York.

6. Ismail, S.A.1997. Vermicology, Biology of Earthworms. Orient Longman, Chennai.

7. Alpha Soli, I. Arceivala.1998. Wastewater treatment for pollution control - Second Ed. Tata McGraw Hill Publication Company Ltd., New Delhi.

8. Asthana, D.K. and Asthana, M.2001. Environmental Problems and Solutions. S. Chand and Co., New Delhi.

PAPER-6

BIOTECHNOLOGY

OBJECTIVES

- ❖ To familiarize the use of the data and techniques of biotechnology in living organisms.
- ❖ To find solution of problems concerning human activities including agriculture, medical treatment, industry and environment.

UNIT-I: RECOMBINANT DNA TECHNOLOGY

Gene cloning - the basic steps - various types of restriction enzymes - ligase linkers and adaptors - c DNA - transformation - Selection of recombinants. Hybridization techniques chemical systhesis of oligonucleotides.

Gene probe - Molecular finger printing (DNA finger printing) - RFLP - the PCR techniques - Genomic library - Blotting techniques - Southern blotting - Northern blotting - Western blotting

UNIT-II: CLONING VECTORS

Plasmid biology - cloning vector based on *E. coli* PBR 322 and bacteriophage. Cloning vector for yeast. Cloning vector for Agro bacterium tumefaciens. Cloning vector for mammalian cells - Simian virus 40 - Gene transfer technologies. Human welfare-Genes for vaccines-monoclonal antibodies.

UNIT-III: ANIMAL BIOTECHNOLOGY

Cell culture - Organ culture - whole embryo culture - Embryo transfer - In vitro fertilization (IVF) technology - Dolly - embryo transfer in human. Transgenic animal. Human gene therapy. Cryobiology. Bioethics in animal genetic engineering.

UNIT-IV: MICROBIAL BIOTECHNOLOGY

Fermentation - bioreactor - Microbial products - Primary & Secondary Metabolites - enzymes technology - single cell protein (SCP). Biopolymers, Biopesticides and Biofertilizers. Biological control-microbial inoculants.

UNTI-V: ENVIONMENTAL BIOTECHNOLOGY AND APPLICATIONS OF BIOTECHNOLOGY

Bioremediation - bioremediation of hydrocarbons - Industrial wastes - Heavy metals - Xenobiotics - bioleaching - biomining - biofuels. Applications of biotechnology in agriculture, medicine and food science. Genetically modified organism (GMO'S) - GM foods. Biotechnology & biosafety – IPR- Patent- patenting of biological materials-product patents.

REFERENCE BOOKS

1. Purohit, S.S. and S.K.Mathur. 1999. Biotechnology Fundamentals and Application. Agro Botanica, New Delhi.

2. Alan Scragg. 1999. Environmental Biotechnoogy, Longman Publication.

3. R.C.Dubey 2001 A text book of biotechnology. Rajendra Ravindra Printer. New Delhi.

4. T.A. Brown 2004 Gene cloning and DNA analysis. Blackwell Science, Osney Mead, Oxford.

5. Dawson, M.T., Powell .R, and Gannon, F. 1996. Gene Technology. Bios Scientific Publishers.

6. Chopra, V.L. and Nanin, A.1992. Genetic Engineering and Biotechnology. Oxford   and I BH Publishing Co., New Delhi.

7. Marx, J.L.1989 A Revolution in Biotechnology. Cambridge University, Press, Oxford.

8. Old, R.W.and Primrose, S.B.1985 Principlesof Gene Manipulations. An introduction to Genetic Engineering. Oxford Blackwell Publishers, London.

9. Winnacker, E.L. 2003. From Genes to Clones. Panima Publishing Corporation,   New Delhi.

10. Gupta, P.K. 2004. Biotechnology and Genomics. Rastogi Publications, Meerut.

11. Das, H.K. 2004. Text Book of Biotechnology. Wiley Dreamtech India Pvt. Ltd., New Delhi.

ELECTIVE

PAPER-2

(to choose either A or B)

A. ENDOCRINOLOGY

OBJECTIVES

- ❖ To learn the objectives of endocrinology.
- ❖ To study the comparative account and functions glands of vertebrates, crustacean and insect with their functions.

UNIT-I: GENERAL ENDOCRINOLOGY

Endocrine glands and its hormones- classification-features. Endocrine glands in crustaceans, insects and vertebrates. Hormonal effects and regulation- Experimental methods of hormone research - general classes of chemical messengers-General classes of hormones.

UNIT-II: PHYLOGENY AND ONTOGENY OF ENDOCRINE GLANDS

Pituitary, Pancreas, Thyroid, Parathyroid, Adrenal, Thymus, Testis and Ovary in the following classes Pisces, Amphibians, Reptiles, and Mammals.

UNIT-III: INSECTS AND CRUSTACEAN ENDOCRINILOGY

Concepts of neurosecretions-endocrine systems in crustaceans-endocrine control of moulting and metamorphosis-neuroendocrine system in insects-endocrine control of moulting-metamorphosis, and reproduction.

UNIT-IV: VERTEBRATE REPRODUCTIVE ENDOCRINOLOGY

Structure of mammalian testis and ovary-male and female sex accessory organs-hormones of testis and ovary-estrous and menstrual cycle-hormones of pregnancy-parturition-hormonal control of lactation.

UNIT-V: HORMONES AND HEALTH

Hormonal control of metamorphosis in an anuran amphibian. Hormones and health-production of hormones as pharmaceuticals.

REFERENCE BOOKS

1. Haris, G.W. and B.T. Donovan. 1968. The Pituitory Gland. S. Chand and Co.,

2. Bentley, P.J. 1985. Comparative vertebrate endocrinology, Second Edition, Cambridge University Press. Cambridge.

3. Mac Hadley. 1992. Endocrinology, 3rd Edition. Prentice - Hall Inc. A Simon & Schuster Company, Englewood Cliffs, New Jersey. USA.

4. Ingleton, P.M. and J.T. Bangara. 1986. Fundamentals of comparative vertebrate endocrinology, Kluwer Academic Publishers.

5. Turner, C.D. and J.T. Bangara. 1986. General endocrinology. Saunders International Student edition. Toppan Company Limited. Tokyo.

6. Barrington, E.J.W. 1985. An introduction to general and comparative endocrinology. Claredon Press Oxford.

B. BIOCHEMISIRY

OBJECTIVES

- ❖ To study the chemical constituents of living matter, chemistry of food stuffs and its metabolism in animal systems.
- ❖ To know the bioenergetics and hormonal regulation.

UNIT-I: WATER

Water - Biological importance, pH and Acid - Base balance. Henderson Hasselbach equation. Buffers - Biological importance. Acidosis, Alkalosis. Electrolyte and water balance.

UNIT-II: BIOMOLECULES

Amino acids - structure, classification and function. Peptide bonds. Essential and non - essential amino acids, isoelectric point, switter ion. Protein - structure, classification, Properties of protein - Deamination, transamination, transmethylation.

Carbohydrate - structure, classification and biological significance.

Lipid - Structure classification and biological significance

UNIT-III: ENZYME AND BIOENERGETICS

Enzymes - general properties, function, classification, nomenclature. Enzyme kinetics - Factors affecting enzyme action, Mechanism of enzyme action, Enzyme regulation.

1. Glycogenesis, 2. Glycogenolysis, 3. Glyconeogenesis, 4. Glycolysis, 5. Hexose mono phosphate shunt. Biosynthesis and Oxidation of Fatty Acids. Energetics.

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UNIT-IV: HORMONES

General function, Classification - Steroid Hormones, Protein Hormones.

Synthetic Hormones-Mechanism of Hormone action.

UNIT-V: VITAMINS

Water and Lipid soluble Vitamins - structure, classification, sources and deficiencies in man.

Reference Books

1. Murray, R. K, Granner, D.K. Maynes, P.A and Rodweli, V. W. 1998. Harper's Biochemistry. 25th Edition. McGraw Hill, New York.

2. Hames, B. D., Hoopa, N.M and Houghton, J.D. 1998. Instant notes in Biochemistry. Viva Books Pvt. Ltd. New Delhi.

3. Jain, J. L. Jain, S. and Jain N. 2005. Fundamental of Biochemistry, S. Chandra & Co. Ltd. New Delhi..

4. Vasudevan, D.M. and Sreekumar. S. 2000. Text of Biochemistry for Medical students. Jaypee Brothers, Medical Publishers (P) Ltd. New Delhi.

5. Rama Rao, A.V.S.S. 1986. Text Book of Biochemistry. L.K. & S Publishers. A.P.

6. Ambika, S. 1990. Fundamentals of Biochemistry for Medical Students, Published by the author.

7. Lehninger, A.L. 2004. Principles of Biochemistry. CBS Publishers, New Delhi.

8. Zubay, G.1989. Biochemistry. McMillan Publishing Co., New York.

9. Voct, D and Voct, J.G. 2004. Biochemistry. John Wiley and Sons, Inc.

MAIN PRACTICAL

PAPER-1

LIFE AND DIVERSITY OF INVERTEBRATES AND CHORDATES AND CELL AND MOLECULAR BIOLOGY

INVERTEBRATA (Slides / Specimens / Xerox)

1. Identification and study of selected Protozoans and Helminthes of medical importance. (Any Two)

2. Identification and study of sections of available animals from Cnidaria, Aschelminthes and Annelida to understand the evolution of /different types of coelom.

3. Identification and study of larval forms from all major phyla of Invertebrates.

4. Identification and study of types minor phyla.

5. Identification and study of Invertebrate fossils

6. Dissection of digestive system of any insect, pila, sepia / loligo

7. Dissection of nervous system of Prawn, any insect, Pila,and Sepia/Loligo.

8. Dissection of reproductive system of any insect.

9. Mounting of:

a. Appendages or Prawn

b. *Gnathochilarium*, Radula of Pila

c. Sting of Honey bee

d. *Pedicellaria* of Sea urchin-Demonstration

e. Aristotle's lantern of sea urchin-Demonstration

10. Study of prepared slides of mouth part of Honey bee, Housefly, Mosquito, Bed bug and Butterfly to relate structure and function.

CHORDATA   (Slides / Specimens / Xerox)

1. Study of the following specimen to bring out their affinities: a.
Amphioxus

b. Balanogossus

c. Ascidian

d. Peteromyzon

2. Study of the following specimens with reference to their adaptive features for their respective modes of life

a. Echeneis

b. Ichthyophis / Uraeotyphlus

c. Hyla

d. Draco

e. Pigeon

f. Bat

3. Study of the following skull types with reference to jaw suspensions a.
Fish

b. Frog

c. Calotes

d. Snake

e. Rat/Rabbit

4. Dissection and mounting of Webberian ossicles in Cat fish.

5. Dissection of aortic arches in Teleost

6. Dissection of aortic arches in Calotes/rat

7. Dissection and display of IXth and Xth Cranial nerves of cat fish

8. Demonstration of portal system of Rat

9. Demonstration of urinogenital system of Rat.

CELL AND MOLECULAR BIOLOGY
CYTOLOGICAL TECHNIQUES
Micrometry-measurements using ocular and stage micrometers-measurements of cell from any prepared slide.
Vital staining-Buccal smear stained with methylene blue.

CHROMOSOME
Chromosome preparation-procedure. Preparation of meiotic chromosomes from any fish (demonstration)
MOLECULAR BIOLOGY TECHNIQUES (Demonstration only)
Centrifuge, Isolation of DNA from Liver-Isolation of RNA-Denaturation of DNA-measurement of spectrophotometry-isolation and analysis of proteins-electrophoresis.

MAIN PRACTICAL

PAPER-2

GENETICS, ENVIRONMENTAL BIOLOGY AND BIOTECHNOLOGY

GENETICS

1. Preparation of culture medium Culture of Drosophila. Methods of maintenance. Sex identification. Identification of four mutants.

2. Identification of blood groups A,B, ABO and Rh.

3. Mounting of salivary glands of Drosophila larva or Chironomus larva. Analysis of banding pattern

4. Preparation of Buccal smear to show squamous epithelial cells.

5. Karyotyping using human metaphase chromosome plates (Giemsa stained). Eye Karyotyping, Identification of syndromes (Down, Klinefelter and Turner) from Karyotype Photographs showing clinical features of each syndrome case.

6. Problems relating to the application of binominal theorem in population genetics with reference to P.T.C., Earlobe attachment etc.

ENVIRONMENTAL BIOLOGY

1. Estimation of Aquatic - Primary productivity - Dark and Light bottle.

2. Estimation of Dissolved oxygen, Salinity, Nitrites, Phosphates, Calcium, Silicates and Alkalinity in water samples.

3. Analysis of Industrial effluent - TDS, TSS, BOD, (COD - Demonstration).

4. Collection, isolation and identification of Plankton.

5. Study of sandy, muddy and rocky shore fauna with special reference to the adaptation to the environment.

6. Animal Association - parasitism, mutualism and commensalisms.

7. Visit to:-

a). Drinking

b). Effluent treatment plant

c). Sewage treatment plant.

d). Sandy, Muddy and Rocky Shores.

BIOTECHNOLOGY

Visit to Biotechnology Laboratory to observe the demonstration of,

1. Tissue culture.

2. Titration and preparation of virulent phage.

3. Isolation of DNA from the plasmids.

4. Restriction enzymes digestion of DNA.

5. DNA electrophoresis in Agarose gel.

Necessary books may be referred to learn the techniques and to be recorded in the record Note books. Observation of photographs of different instruments used in Biotechnology, their principles and applications.

ELECTIVE

PRACTICAL

PAPER-1

(to choose either A or B)

A.ENDOCRINOLOGY

Dissection and localization of endocrine glands in any one suitable vertebrate.

Dissection of neuroendocrine complex in insects.

Parabiosis in insect - cockroach.

Ovariectomy in cockroach.

Histology of pituitary, thyroid, adrenal, pancreas, testis and ovary.
Permanent slide preparation of any one endocrine gland

ELECTIVE

PRACTICAL

PAPER-1

B.BIOCHEMISTRY

1. Buffer preparation and determination of PH - Demonstration,

2. Enzyme kinetics - anyone enzyme (Salivary amylase) Maltose standards, influence of enzyme concentration, time course, pH, Temperature, Substrate concentration (Lineweaver Burk Plot) on enzyme activity.

3. Qualitative analysis of urine - protein, glucose, Ketone and acetone bodies.

4. Chromatography: Determination of amino acids in body fluids and tissues of goat.

5. Quantitative estimation of glucose, protein, cholestoerol, urea and creatinine in the serum of goat.

Principles and application of spectrophotometry or colorimetry, electrophoresis, centrifuge, Chromatography.

SEMESTER III

PAPER-7
ANIMAL PHYSIOLOGY

OBJECTIVES

- ❖ To gain knowledge on organs system and functions.
- ❖ The physico-chemical coordination of the animals.

UNIT-I: NUTRITION

Nutrition - nutrients - digestion and adsorption of proteins, carbohydrates and lipids. Role of gastrointestinal hormones in digestion.

UNIT-II: RESPIRATION AND CIRCULATION

Physiology of respiration in Man. Respiratory Pigments, nervous and chemical control of respiration, BMR.

Circulation - types of hearts - physiology of cardiac muscle - heart beat and its regulation - blood coagulation and theories.

UNIT-III: EXCRETION AND OSMOREGULATION

Excretion - excretion of metabolic waste products in relation to the environment - physiology of excretion in Man

Iono - osmoregulation in Invertebrates (crustaceans), fishes, birds and mammals - hormonal control.

UNIT-IV: ANIMAL AND REPRODUCTION

Neuro muscular co-ordination - types of neurons, transmissions of nerve impulse and reflex action. Chemical composition of muscle fiber and physiology of muscle contraction. Myoneural Junction. Endocrine glands in mammals - Physiology of mammalian reproduction - reproductive cycle - hormonal control of reproduction.

UNIT-V: BEHAVIOURAL PHYSIOLOGY

Bioluminescence - chemistry and functional significance. Behaviour (types - trophism, taxis, kinesis, reflex, learning). Temperature regulation: Poikilotherms, homeotherms and heterotherms - hibernation, aestivation - diapause.

REFERENCE BOOKS

1. Hoar, W.S.1991. General and Comparative Physiology. Prentice Hall of India, New Delhi.
2. Prosser, C.L. 1973. Comparative Animal Physiology, 3rd edn. W.B. Saunders & Co., Philadelphia.
3. Barrington, E.J.W.1975. An Introduction to General and Comparative Endocrinology. Clarendon Press, Oxford
4. Bentley, P.J.1971. Endocrine and osmoregulation, Springer Verlag, New York.
5. Palmen,J.D. Brown, I.R and Hastings, J.W.1970. Biological clocks, Academic Press, London.
6. Welson, A. 1979. Principles of Animal Physiology.McMillan Publishing Co. Inc. New York.
7. Schmidt Nelssen, K.1985. Animal Physiology. Adaptation and Environment Club, London.
8. Herkat, P.C.and Mathur, P.N.1976. Text Book of Animal Physiology.S.Chand Co. Pvt, Ltd., New Delhi.

PAPER-8

DEVELOPMENTAL BIOLOGY

OBJECTIVES

❖ To gain knowledge on the experimental aspects of embryology.
❖ To study the modern tools in embryology.

UNIT-I: EARLY DEVELOPMENT

Gastrulation movements: role of egg cortex - cell surface in morphogenesis. Cell adhesion and cell communication. Chemotactic induced aggregation - aggregation in sponges. Experimental analyses in the early development of Echinoderms, Amphibians and birds.

UNIT-II: ORGANOGENESIS

Formation of organ rudiments, differentiation and development of heart and kidney in different mammals. Organiser, Inductive tissue interactions in developments.

UNIT-III: GENES AND DEVELOPMENT

Nuclear transplantation. Cellular differentiation and protein synthesis. Differential activation. Developmental genetic defects. Role of cell death in development.

UNIT-IV: REGULATION OF DEVELOPMENT

Metamorphosis - morphological and biochemical changes during amphibian metamorphosis. Hormonal control of metamorphosis in amphibians - Neuro endocrine control of insect metamorphosis - Biochemistry and mechanism of action of hormones during metamorphosis

UNIIT-V: EMBRYONIC NUTRITION

Nutritional requirements of Embryo- modes of embryonic nutrition –Food reserve and embryonic nutrition- embryonic nutrition from mother –physiology of placenta

REFERENCE BOOKS

1. Balinsky, B.I.1981 An Introduction to Embryology. W.B Saunders Co., Philadelphia.
2. Karp,G. and Berrill,N.J.1981. Development. McGraw Hill, New York.
3. Saunders, J.W.1982. Developmental Biology. MacMillan Co., London.
4. Nagabhushanam,R. and Sarojini,R.2002 Invertebrate Embryology. Oxford and IBA Publishing Co.
5. Tyagi,Rajiv and Shukla,A.N.2002. Development of Fishes. Jaya Publishing House, New Delhi.
6. Browder, W.1984.Developmental Physiology. Saunders College Publishing, Rinchert and Winston.
7. Gilbert, S.F.2003.Developmental Biology. Sinamer Associates Inc. Saunderland, Massachusets, U.S.A.
8. Oppenheimer, S.B.1980.Introduction to Embryonic Development. Allyn and Bacon,Inc. U.S.A.
9. Mitra, S.1994. Genetics, A Blueprint of Life. Tata McGraw - Hill Publishing Company Ltd., New Delhi.

PAPER-9

IMMUNOLOGY

OBJECTIVE

- ❖ To Understand the Structural and functional basis of immungloy and immune system.
- ❖ To understand the mechanism of antigen-antibody reaction.

UNIT-I: IMMUNE BIOLOGY

The cellular constituents of the lympho reticular system-phagocytic cells-poly morpho nuclear neutophils, mono nuclear phagocytes eosinophils and lymphocytes

UNIT-II: IMMUNOGLOBULINS

Immunoglobulins-structure, isotypes and biological function. Antigenic determinant on immunoglobulin-isotype, allotype and idiotype. Immunoglobulin superfamily, monoclonal and polyconal antibodies. organization and expression of immunoglobulin genes. Synthesis of immunoglobulin and disorders of immunoglobulin synthesis.

UNIT-III: DETECTION AND APPLICATION OF ANITGEN ANTIBODY REACTION

Precipitation - agglutination - complement fixation - immunoassay using labelled reagents

UNIT-IV: MECHANISM OR IMMUNE SYSTEM

Antigen-antibody interaction. MHC- Restriction organization and inheritance of MHC, Antigen processing and presentation.

UNIT-V: MEDIATORS OF IMMUNE SYSTEM

B-cell Receptors, T-cell receptors, cytokine, adhesion molecules, complements, hypersensitivity reaction, transplantation immunology.

REFERENCE BOOKS

1. Roitt,I.M.1994. Essential Immunology. Blackwell Scientific, Oxford.
2. Richard A.Goldsby, Thomas T.Kindt and Barbara A. Osborne. 2000. Kuby Immunology.Freeman and Co., New York.
3. Stites,D.P.,Terr,A.I. and Parsloio,T.G. 1997.Medical Immunology. Prentice Hall, New Jersey.
4. Janeway,C.A and Travers,P. 1997.Immunobiology.Current Biology Ltd., London.
5. Paul,W.E.M.1989. Fundamentals of Immunobiology. Raven Press, New York.
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7. Champion,M.D. and Cooke,A.1987.Advanced Immunology. J.B.Lippincott Ltd., Philadelphia.
8. Kannan,I.2007. Immunology. MJP Publishers, Chennai.

ELECTIVE

PAPER-3

(to choose either A or B)

A. FISHERIES SCIENCE

OBJECTIVES

- ❖ The aim of the paper is to understand the morphology, classification and identification of fishes and the fisheries and fishery resources of India.
- ❖ Moreover information about the biology of the fishes goes a long way in managing the fishery resources and their sustainable utilization.
- ❖ As fishes constitute perishable commodity, preservation and processing are also quite essential.
- ❖ To know the different methods of preservation and processing of fishes.

UNIT-I: BIOLOGY OF FISHES AND CLASSIFICATION

General morphology and outline classification of fishes - major groups of fishes and their characteristics - morphometric and meristic characters of elasmobranchs and teleost fishes.

Basic anatomy of fish - digestive, circulatory, respiratory, nervous and reproductive systems.

Food and feeding habits, maturity, fecundity, spawning and survival of Indian fishes.

UNIT-II: GROWTH AND POPULATION DYNAMICS

Length-weight relationship and factors influencing growth condition, age determination

Theory of fishing, unit stock, recruitment, growth, mortality, migration, fish tagging and marking.

UNIT-III: INLAND CAPTURE AND MARINE CAPTURE FISHERIES OF INDIA

Fishery zones and type of fisheries in India.

Riverine, Estuarine, Coldwater, Reservoir and Pond fisheries.

Present status and scope of inland capture fisheries - their fishery characteristics, distribution and importance.

Present status and scope of marine capture fisheries - crustaceans crabs), (prawn/shrimp, lobster and Molluscs (clam, cockle, mussel, oyster, their cephalopods) and fishes - fishery characteristics, distribution and importance.

UNIT-IV: FISHERY SURVEY METHODS

Methods of surveying the fishery resources - acoustic method, aerial method, survey of fish eggs and larvae, analyzing population features - growth mortality selection.

UNIT-V: CRAFTS AND GEARS

Principal methods of exploitation of fishes - indigenous and modern gears and crafts.

Principal methods of fish preservation and processing in India

Types of spoilage, causative factors - marketing and economics.

REFERENCE BOOKS

1. Day, F. 1981. Fishes of India, Vol.I and Vol. II. William Sawson & Sons Ltd.,London.
2. Jhingran, C.G. 1981. Fish and Fisheries of India. Hindustan Publishing Co., India.
3. Maheswari, K. 1993. Common fish diseases and their control. Institute of Fisheries Education, Powakads, M.P.
4. Santhanam,R. 1980. Fisheries Science. Daya Publishing House, New Delhi.
5. Yadav, B.N. 1997. Fish and Fisheries. Daya Publishing House, New Delhi
6. FAO Volumes for fish identification.
7. Bal D.V. and Rao, K.V. 1990. Marine Fisheries of India. Tata McGraw Hill Publishing Co. Ltd., New York.
8. Biswas, K. P. 1996. A Text Book of Fish, Fisheries and Technology. Narendra Publishing House, Delhi.
9. Srivastava, C.B.L. 1999. Fish Biology. Narendra Publishing House, Delhi.

PAPER-3

B. BIOPHYSICS

OBJECTIVES

- ❖ To gain knowledge on the principles and methods in conducting a basic research.
- ❖ To know the principle and application of various research instruments.

UNIT-I: STRUCTURE OF BIOMOLECULES

Electron configuration of an atom. Bonds - Covalent bond, Hydrogen bond, Disulphide bond, Peptide bonds. Forces between Molecules - Electrostatic force, Van der Waal's forces - hydrophobic and hydrophilic - biological importance.

UNIT-II: THERMODYNAMICS AND BIOLOGICAL OXIDATION

Laws of Thermodynamics - Concept of free energy and entropy - Exergonic and Endergonic reactions. Rate of reactions - Effect of sunlight and temperature on reactions. Energy of Activation - Arrhenius expression.

Diffusion - Fick's Laws, constant laws. Osmotic coefficient - Gibbs Donnan equilibrium.

Oxidation and reduction reactions - Redox potentials in biological system, High energy phosphate group. Biouminescence.

UNIT-III: MICROSCOPY

Principle and biological application of Light microscope, Electron microscope, Polarising microscope, Fluorescent microscope, Phase contrast microscope, Dark field microscope, Interference microscope and X-ray microscope.

UNIT-IV: PHOTO BIOPHYSICS

Electromagnetic spectrum - visible and invisible region. Principles involved in Photoelectric colorimetry. Principle of Spectroscopy - UV & IR Spectroscopy in biological investigation. Effects of UV on biological systems.

Delayed effects of radiation - Ageing, reduction in life span, cancer.

Radioactive isotopes - measurements - GM tubes, Liquid Scintillation counters. Autoradiography. Effects of radiation.

UNIT-V: BIOPHYSICAL PRINCIPLES APPLIED TO PHYSIOLOGY

Biophysical aspects of vision, hearing, nerve conduction and muscle contraction.

REFERENCE BOOKS

1. Bose, S. 1982. Elementary Biophysics. Jyoth Books,

2. Bums, D.M. and MacDonald, S.G.G. 1979. Physics for Biology and Premedical students. ELBS and Addisson - Wesley Publishers Ltd., London.

3. Casey, E.J. 1962. Biophysics concepts and Mechanism. Affiliated East-West Press Pvt. Ltd., New Delhi.

4. Das, D. 1982. Biophysics and Biophysical Chemistry. Academic Publishers. New Delhi.

5. Epstein, H.T. 1963. Elementary Biophysics, selected topics. Addisson - Wesley Publishing Company Inc. London.

6. Palanichamy, S and Shanmugavelu, M. 1991. Priniples of Biophysics. Palani Paramount, Publication; Tamil Nadu.

7. Roy, R.N. 1996. A Text Book of Biophysics, New Central Book Agency Ltd, Calcutta.

SEMESTER IV

PAPER-10

RESEARCH METHODOLOGY

OBJECTIVES

- ❖ The main objectives of this paper are to expose students to state of the art instrumentation.
- ❖ To introduce them to the principles and methods of various instruments used in biology and to prepare them to use these techniques in their own research.
- ❖ The course is a combination of lectures and demonstrations on basic principles and applications of the Spectrophotometers, Chromatographs and Electrophoresis system.
- ❖ With the aid of computer system and software, the students are also given hands on training in bioinformatics.
- ❖ Also, this paper is to acquire knowledge on the preparation of research manuscripts etc.

UNIT-I: BIOSTATISTICS & BIOINFORMATICS

Collection and analysis of biological data - mean, median, mode Standard deviation, Standard error, Coefficient of variation, Student 't' test, Skewness, Kurtosis, Chi - square, Correlation, Regression and ANOVA.

Internet - Worldwide Web - Search Engines - their functions. Boolean searching - file formats.

Biological data bases - sequence and structure - date retrieval - searching source data bases - sequence similarity searches - FASTA and BLAST, clustral and phylip.

UNIT-II: SPECTROSCOPY

Absorption and Emission principles - Principle and application of UV-visible, Spectroflurometer, flame photometer, Atomic Absorption and emission spectrophotometers, NMR and Mass spectrometer in Biology.

UNIT-III: CHROMATOGRAPHY & ELECTROPHORESIS

Principles and Application of Chromatography: Paper, Thin layer, column, Ion Exchange, Gel filtration, Gas Liquid, HPLC and affinity. Principles and Application of Electrophoresis: Paper, Agarose, PAGE, SDS PAGE and Iso-Electric focusing.

UNIT-IV: MICROSCOPY

Principles, construction and biological uses of phase contrast, fluorescence, scanning and transmission electron microscopes.

UNIT-V: PREPARATION OF MANUSCRIPTS

Preparation of index cards-Reference collection - preparation of thesis - preparation of Scientific paper for publication in a Journal. Internet and e-journals. Computer aided techniques for data analysis, data presentation and slide preparation.

REFERENCE BOOKS

1. Anderson, Durston and Polle.1970. Thesis and Assignment writing. Wiley Eastern Ltd., New Delhi.
2. Comir and Peter Wood Ford.1979. Writing scientific papers in English. Pitman Medical Publishing Co., London.
3. Ewing, G.W. 1988. Instrumental methods of chemical analysis, McGraw Hill Book Company.
4. Daniel, M. 1989. Basic biophysics for biologists. Agro-Botanical Publishers, India.
5. Skoog, A., Douglas, J. and Leary, J.J. 1992. Principles of Instrumental Analysis. Sanders Golden Sunberst Series, Philadelphia.
6. Day, R.A. 1994. How to write and publish a scientific paper. Cambridge University Press, London.
7. Palanichamy, S. and M. Shanmugavelu.1997. Research methods in biological sciences. Palani Paramount Publications, Tamil Nadu, India.
8. Wilson and Walker. 2000. Practical biochemistry - principles and techniques. Cambridge University Press.
9. Milton, J.S. 1992. Statistical methods in Biological and Health Sciences. McGraw Hill Inc., New York.
10. Gupta, S.P. 1988. An easy approach to statistics. Chand & Co., New Delhi.

11. Gurumani, N. 2006. Research Methodology for Biological Sciences. MJP Publishers, Chennai.

12. Veerakumari, L. 2006. Bioinstrumentation. MJP Publishers, Chennai.

PROJECT/DISSERTATION WITH *VIVA VOCE*

(For those choosing this Paper, the Main Practical 4: is compulsory)

Objectives

To promote original thinking, insemination of knowledge, modulation and innovation of thought, as an exercise, in order to transport the young minds to the expanding horizon of their chosen area of knowledge and transform them into knowledge generators.

Project / Dissertation	75 Marks
Viva voce	25 Marks

PAPER-11

EVOLUTION

(This Core Paper is compulsory for those not choosing Project / Dissertation with *Viva Voce*)

OBJECTIVES

To understanding the concepts of animal evolution through evidences, process and products.

UNIT-I: EVIDENCES

Evidences: The need of evidences for the fact of evolution - evidences from comparative anatomy, embryology, physiology and biochemistry - visual pigments, hemoglobin, protein sequences in phylogeny.

Biogeography, Platetectonics and continental drift - Evidences from systematic, evolutionary taxonomy - Evidences from paleontology - evolutionary trends in fossils, types of fossils. Process of fossilization - Evolution of homeotherms - Evidences from genetics - gene and chromosome homology, hybridization, universality of the genetic code.

UNIT-II: MECHANISM OF EVOLUTION

Mutationism - Views of De Vries and of R.B. Golschmidt; hopeful monsters. Inadequacies of mutationism.

Lamarckism - Life of Lamarck - Lamarckian postulates - inadequacies of Lamarckism.

Natural selection - In nature and laboratory - Creative aspects of natural selection - modern understanding of selection, stabilizing and diversifying and directional selection.

Adaptation - Nature and types of adaptation - Adaptive trends - Quantifying adaptation - Batesian and Mullerian mimicry and evolution.

Polymorphism - Transient and stable - Maintenance of polymorphism.

UNIT-III: GENETIC BASIS OF EVOLUTION AND SPECIATION

Mutations and their role in evolution - the neutralist hypothesis - population size and evolution - the role of genetic drift - hybridization and evolution - The role of polyploidy, isolating mechanisms - premating, post mating - problems of the origin of isolating mechanism.

Structure of species - Clones, peripheral population isolates,

Genetics and Ecology of speciations. Mayer's founder principle and genetic evolution in the peripheral isolates - Ecological opportunities for speciation.

UNIT-IV: ORIGIN OF HIGHER TAXA - I

Definition Simpson's definition of the higher taxa - Evidence for the origin of higher taxa from living forms - Evidences for the origin of higher taxa from the fossil record.

Mechanisms in the origin of higher taxa Polyploidy - Deviation, Allometry - Carcinogenesis followed by neoteny.

UNIT-V: ORIGIN OF HIGHER TAXA - II

Modes of origin of higher taxa (1) Mosaic mode. Connecting links between vertebrate classes, (2) Quantum evolution. Simpson's adaptive grid.

Rate of evolution Horotely, Bradytely and Tachytely. Gradualism versus punctuated equilibrium - Extinction and its causes.

HUMAN EVOLUTION

Sociobiology Definition and scope - selfish gene, altruism and kin selection bioethics.

REFERENCE BOOKS

1. P.A.Moody. 1978. Introduction to Evolution. Harper International.

2. G.L. Stebbine. 1979. Process of Organic Evolution. Prentice Hall India, New Delhi.

3. E.O.Dodson. 1990. Evolution. Reinhold, New York.

4. D.S.Bendall. 1983. Evolution from molecules to man. Cambridge University Press.UK

5. M. Grene. 1983. Dimensions of Darwinism. Cambridge University Press. UK

6. E.C.Minkoff. 1984. Evolutionary Biology. Addison - Wesley. London.

7. Montagu. 1980. Sociobiology examined. Oxford University press.

8. Abraham, J.C.B. 1987. Evolution: A Laboratory Manual. Macmillan India Ltd., Madras.

PAPER-12

ENTOMOLOGY

OBJECTIVES

- ❖ To gain knowledge of insects.
- ❖ Economic importance of insects related to beneficial insects, sericulture, insect pests and their control and vector borne diseases.

UNIT-I: CLASSIFICATION

Classification of insects upto order with examples.

UNIT-II: BENEFICIAL INSECTS

Biology of honey bees, lac insects and their management.

UNIT-III: SERICULTURE

Prospects of sericulture, Biology of silkworm (Nutrition, Genetics, Endocrinology, Reproduction, Pest and Diseases).

UNIT-IV: INSECT PESTS AND THEIR CONTROL

Insects as crop pests: Types of injuries and loss caused to plants in general.
Factors governing the outbreak of pests.

Principles and methods of pest suppression: Natural, Cultural, mechanical, physical, chemical, Biological and Integrated pest management.

UNIT-V: INSECTS AS VECTORS

Vector borne diseases: Method of transmission of parasitic agents with special reference to mosquitoes and houseflies.

REFERENCES BOOKS

1. William S. Romoser and John G. Stoffolano.W. M.1994. The Science of Entomology C.Brown Publishers, England.
2. Yataro Tazima, Kodarsha .1978. The silkworm. An important laboratory tool. Scientific Book Ltd., Japan.
3. Ananthakrishnan, T.N. 2002. Insect Plant Interactions. Oxford and I.B.H, New Delhi.
4. P.G.Fenemore, Alkaprakash. 1992. Applied Entomology, Wiley Eastern Ltd., Delhi.
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6. Larry P.Pedigo. 1989. Entomology and Pest Mangement. Prentice Hall, New Jersey.
7. Metcalf, C.V. and Flint, W.P. 1979. Destructive and useful insects, their habitats and control. Tata McGraw Hill Publications, New Delhi.
8. Daniel Altman Robets. 1978. Fundamental of Plant Pest Control. C.R.S. Publishers and Distributors,Delhi,
9. Chapman, R.F.1988. The insect structure and Function. Cambridge University Press, U.K.
10. Richards, O.W. and Davies, R.G. 1997. Imm's General Text Book of Entomology Tenth Edition. Vol I and II. R.I Publications, New Delhi.
11. Rajeev K.Upadhyay, Mukerjii K.G. Chanda, B.P. and Dubey, O.P. 1998. Integrated Pest and Disease Management. APH Publishing Corporation, New Delhi.
12. David B.V., Muralirangan M.C. and Meera Murali Rangan. 1992. Harmful and Beneficial Insects. Popular Book Depot, Chennai.
13. Ramakrishna Ayyar T.V. 1989. Handbook of Economic Entomology for South India. Books and Periodicals Supply Service, New Delhi.
14. Frost S.W.1994. General Entomology. Narendra Publishing House, Delhi.
15. Dennis S.Hill. 1993. Agricultural Insect Pests of the Tropics and their Control. Second Edition, Cambridge University Press, U.K.
16. Saxena. A.B. 1996. Harmful Insects. Anmol Publications, New Delhi.
17. Patton. W.S. and Cragg F.W.1981. A Text Book of Medical Entomology. International Books and Periodicals Supply Service, New Delhi.
18. Rathinaswamy, T.K.1986. Medical Entomology. S.Viswanathan and Co., Madras.
19. Sundari, M.S.N. and Santhi, R. 2006. Entomology. MJP Publishers, Chennai.

ELECTIVE

PAPER -4
(to Choose either A or B)

A. SERICULTURE

OBJECTIVES

- ❖ To know the Biology of silkworm, their economic importance and methods in sericulture.
- ❖ To develop sericulture is a need based curriculum.

UNIT -I: ECONOMIC IMPORTANCE AND SILKWORM BIOLOGY

Prospects and status - Silk producing species - their distribution - *Bombyx mori* - life cycle - organization of larvae, pupae and moth - structure of the silk gland.

UNIT-II: MORICULTURE

Mulberry - varieties - distribution - methods of cultivation and preparation - Harvest - Transport and preservation of leaves. Feeding and nutrition - specificity of diet - Factors of nutrition - Diet and growth. Pest and diseases.

UNIT-III: SILKWORM REPRODUCTION AND GENETICS

Reproduction - Growth and Development of silkworms - Physiology of molting in different varieties (Uni, bi and multivoltine) - Endocrinology of reproduction and development. Genetics - mutation breeding and development of new strains.

UNIT-IV: PATHOGENIC DISEASES AND PEST

Pathology - Viral, bacterial, fungi and protozoan diseases - control mechanisms. Uzifly menace.

UNIT-V: SILKWORM REARING AND SILK REELING

Rearing operations - Selection and construction of rearing house Incubation - Hatching - brooding, Harvesting etc. Reeling techniques - lacing skinning. Re-reeling etc.

REFERENCE BOOKS

1. Ganga, G. and Sulochana Chetty, J. 1997.An Introduction to Sericulture. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
2. Ganga, G. 2003. Comprehensive Sericulture Vol-II: Silkworm Rearing and Silk Reeling. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
3. Hisao Aruga. 1994. Principles of Sericulture (Translated from Japanese).Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
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5. Otsuki, R. and Sato, S.1997. Silkworm Egg Production (Translated from Japanese). Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
6. Eikichi Hiratsuka. 1999. Silkworm Breeding (Translated from Japanese). Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
7. Mahadevappa, D., Halliyal, V.G., Shankar, D.G. and Bhandiwad, R., 2000. Mulberry Silk Reeling Technology Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
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9. Wu Pang-Chuan and Chen Da-Chuang. 1994. Silkworm Rearing - Published by FAO - USA. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
10. Lu Yup-Lian and Liu-Fu-an. 1991. Silkworm Diseases - Published by FAO - USA. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.

PAPER -4

B. MICROBIOLOGY

OBJECTIVES

- ❖ To acquire a basic knowledge of the microbes in general and of the environmental, medical and industrial important microbes in particular in order to have an integrated approach in biology.
- ❖ Also, to know the basics of sterilization and culture methods in microbiology.

UNIT-I: STRUCTURE AND CLASSIFICATION

Structure and classification of virus, bacteria and fungi.

UNIT-II: STERILIZATION AND CULTURE

Sterilization: Principles - dry heat, moist heat, filtration, Tantilization, pasteurization, Radiation - disinfection.

Culture techniques - media preparation - Aerobic and anaerobic culture techniques - Wet mount, hanging drop, Staining methods, dyes, simple differential and special staining techniques - acid fast stain, spore stain, capsule stain, staining for pure and mixed cultures.

UNIT-III: ENVIRONMENTAL MICROBIOLOGY

Microbial ecology, role of microorganisms in the productivity of ecosystems - Interactions between microorganisms and plants and animal. Microbiology of soil, water and air.

UNIT-IV: MEDICAL MICROBIOLOGY

Pathogenic microbes of bacterial, viral, fungal and protozoan diseases - cure, control and prevention. Antimicrobial chemotherapy - Antibiotics - Source - Classification Mode of action.

UNIT-V: INDUSTRIAL MICROBIOLOGY

Industrial microbiology - Industrial uses of microbes - fermentation products, bioconversions - bioremediation. Products of industrial microbiology - Penicillin, fuel ethanol, vinegar, vitamin B12, citric acid, glutamic acid, protease. Food and Dairy microbiology - Microbes in food - Role of microbes in food production. Dairy and non-dairy products - fermented foods and alcoholic beverages. Pharmaceuticals (antibiotics, vaccines etc.)

REFERENCE BOOKS

1. Tortora, G.J., Funke, R.B. and Case, C.L. 1992. Microbiology - An Introduction. The Benjamin / Cummings Publishing Co., Inc. Sydney.
2. Black, J.G. 1999. Microbiology - Principles and Explorations. John Wiley and Sons Inc. New York.
3. Atlas, R.M. 1995. Principles of Microbiology. Mosby - Year Book Inc.
4. Pelczer, M.J., Reid, R.D. and Chan, E.C.S. 1996. Microbiology. Tata McGraw Hill Co., Ltd. New Delhi.
5. Prescott L.M. Harley J.O. Klein D.A. 1990. Microbiology. WCB Publishers, Sydney.
6. Ananthanaryanan, T. and Paniker, J.C.K. 2000. Text Book of Microbiology Oriental Longman Ltd., Madras.
7. Ahmed, M. and Basumatary. S.K. 2006. Applied Microbiology. MJP Publishers, Chennai.

MAIN PRACTICAL 3

ANIMAL PHYSIOLOGY, DEVELOPMENTAL BIOLOGY AND IMMUNOLOGY

PHYSIOLOGY

1. Estimation of RQ in Fish with reference to Light and temperature.
2. Salt loss and salt gain in fish
3. Estimation of Proteins, Carbohydrates and Lipids in the tissues of Fish
4. Estimation of Blood Urea and Cholesterol.
5. Blood Clotting Time, Bleeding Time, Rouleaux Formation, Preparation of Haemin Crystal.
6. Principle and Application of Sphygmomanometer, Kymograph, Electrophoresis, Haemoglobinometer, ESR.
7. Estimation of Haemoglobin and ESR.

DEVELOPMENTAL BIOLOGY

1. Different stages in development - frog (egg, cleavage, Blastula, Yolk plug stage 24,48,72,96 h Gastrula)
2. Development of chick stage - slide showing C.S.of heart, kidney lens and limb.
3. Slides showing the uterine cycles in a mammal (Rat).
4. Study of slides showing of larval forms: Nauplius, Zoea, Bipinnaria, Leptocephalus.

IMMUNOLOGY

1. Haemagglutination - Quantitative analysis - haemagglutination titration.
2. Preparation of Antigen - RBC - Demonstration.
3. Ouchterlony technique - Demonstration.
4. Immunoelectrophoresis - Demonstration.
5. Slides showing T.S of Spleen, Thymus, lymphnodes and Bones

MAIN PRACTICAL 4

RESEARCH METHODOLOGY, EVOLUTION AND ENTOMOLOGY

RESEARCH METHODOLOGY

1. Problems relating to test of significance (Chi - square test and t - test)
2. Problems relating to correlation, regression and ANOVA.
3. Familiarization of biological and bioinformatics web sites.
4. BLAST search for similar nucleotide sequences.
5. Spectrophotometric estimation of any biological constituent.
6. Electrophoresis - Paper / Agarose gel / PAGE
7. Preparation of index and reference cards.

EVOLUTION (Slides / Specimens / Xerox)

1. Observation of forelimbs and hindlimbs of vertebrates (Frog, Calotes, Bird and Mammal) to study the common pattern of pentadactyl limb and common ancestry of vertebrates.
2. Observation of fossils to study paleontological evidences of evolution.
3. Observation of leaf insects and stick insects in the museum to study adaptation by cryptic colouration and natural selection.
4. Observation of Monarch and Viceroy butterflies to study Batesian mimicry.

ENTOMOLOGY

1. Study of morphology of an insect (local insects to be used).
2. Dissection of digestive, nervous, excretory, reproductive systems of any two insects of different orders.
3. Mounting of different types of mouthparts.
4. a. Field study to collect insect species

   b. Identification of at least 10 insects belonging to different orders.

5. a. Field study for various methods of pest management. b. Field visit to wearhouses and Plant protection centres.

ELECTIVE

PRACTICAL-2
(to choose either A or B)

A.SERICULTURE

1. Study of external morphology of silkworm moth, larvae and pupae.
2. Dissections of digestive and nervous systems in Bombyx mori larvae.
3. Mounting of Silk glands of Silkworm.
4. Study of silkworm rearing and reeling operations (Field visit)
5. Study of silkworm pathology: viral - bacterial - fungal diseases (Field visit - Slides/Specimens /Xerox)

ELECTIVE

PRACTICAL-2

B. MICROBIOLOGY

1. Microscopic observation and identification of microorganisms in Pond water.
2. Types of bacteriophage, bacteria, fungi and algae from the prepared slides / photographs from the book.
3. Collection and Identification of fungus: Bread mould and Coconut mould.
4. Identification of parasitic protozoans (e.g. Plasmodium, Entamoeba, Trypanosoma, Leishmania donovani)
5. Identification of bacteria - staining methods - Gram positive and Gram negative bacteria.
6. Demonstration

   a. Isolation of single colonies streak plate and serial dilution.

   b. Enumeration of microorganisms spread plate and pour platemethods.

   c. Preparation techniques of culture medium for bacterial growth

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BACHELOR OF COMMERCE   (B.Com.)

(With effect from 2017-2018)

The Course of Study and the Scheme of Examinations

S.No.	Part	Study Components Course Title		Ins. hrs /week	Credit	Title of the Paper	Maximum Marks		
							CIA	Exam	Total
SEMESTER I							CIA	Exam	Total
1	I	Language	Paper-1	6	4	Tamil/Other Languages	25	75	100
2	II	English	Paper-1	6	4	English	25	75	100
3	III	Core	Paper-1	6	4	Financial Accounting – I	25	75	100
4	III	Core	Paper-2	5	3	Business Organisation	25	75	100
5	III	ALLIED	Paper-1	5	5	Indian Economy – I	25	75	100
6	IV	Environ. Studies		2	2	Environmental Studies	25	75	100
				30	22		150	450	600
SEMESTER II							CIA	Exam	Total
7	I	Language	Paper-2	6	4	Tamil/Other Languages	25	75	100
8	II	English	Paper-2	4	4	English	25	75	100
9	III	Core	Paper-3	6	4	Financial Accounting – II	25	75	100
10	III	Core	Paper-4	5	3	Business Communication	25	75	100
11	III	ALLIED	Paper-2	5	5	Indian Economy – II	25	75	100
12	IV	Value Education		2	2	Value Education	25	75	100
13	IV	Soft Skill		2	1	Soft Skills	25	75	100
				30	23		175	525	700
SEMESTER III							CIA	Exam	Total
14	III	Core	Paper-5	6	4	Corporate Accounting – I	25	75	100
15	III	Core	Paper-6	5	4	Business Law	25	75	100
16	III	Core	Paper-7	5	3	Banking Theory , Law and Practice	25	75	100
17	III	Core	Paper-8	5	3	Business Statistics and Operations Research – I	25	75	100
18	III	ALLIED	Paper-3	4	5	Business Economics – I	25	75	100
19	IV	Skill based Subject	Paper-1	3	3	Modern Office Management	25	75	100
20	IV	Non-major elective	Paper-1	2	2	General Commercial Knowledge	25	75	100
				30	24		175	525	700

S.No.	Part	Study Components Course Title		Ins. hrs /week	Credit	Title of the Paper	Maximum Marks		
SEMESTER IV							CIA	Exam	Total
21	III	Core	Paper-9	6	4	Corporate Accounting – II	25	75	100
22	III	Core	Paper-10	5	4	Company Law	25	75	100
23	III	Core	Paper-11	5	3	Business Management	25	75	100
24	III	Core	Paper-12	5	3	Business Statistics and Operations Research – II	25	75	100
25	III	ALLIED	Paper-4	4	5	Business Economics – II	25	75	100
26	IV	Skill based Subject	Paper-2	3	3	Financial Services	25	75	100
27	IV	Non-major elective	Paper-2	2	2	Principles of Accountancy	25	75	100
				30	24		175	525	700
SEMESTER V							CIA	Exam	Total
28	III	Core	Paper-13	6	4	Cost Accounting – I	25	75	100
29	III	Core	Paper-14	6	4	Management Accounting – I	25	75	100
30	III	Core	Paper-15	6	4	Income Tax Law and Practice - I	25	75	100
31	III	Core	Paper-16	5	4	Modern Marketing	25	75	100
32	III	Elective	Paper-1	4	3	**(to choose any 1 out of 2)** A. Financial Management B. Services Marketing	25	75	100
33	IV	Skill based Subject	Paper-3	3	3	Personal Selling and Salesmanship	25	75	100
				30	22		150	450	600
SEMESTER VI							CIA	Exam	Total
34	III	Core	Paper-17	6	5	Cost Accounting – II	25	75	100
35	III	Core	Paper-18	6	5	Management Accounting – II	25	75	100
36	III	Core	Paper-19	6	5	Income Tax Law and Practice – II	25	75	100
37	III	Elective	Paper-2	5	3	**(to choose any 1 out of 2)** **A. Practical Auditing** **B**. Customer Relationship Management	25	75	100
38	III	Elective	Paper-3	4	3	**(to choose any 1 out of 2)** A. Human Resource Management B. Sales and Advertisement Management	25	75	100
39	IV	Skill based Subject	Paper-4	3	3	Entrepreneurship Development	25	75	100
40	V	Extension Activities		-	1	Extension Activities	50	0	50
		Total		30	25		200	450	650

Part	Subject	Papers	Credit	Total Credits	Marks	Total Marks
Part I	Languages	2	4	8	100	200
Part II	English	2	4	8	100	200
Part III	Allied (Odd Semester)	2	5	10	100	200
	Allied (Even Semester)	2	5	10	100	200
	Electives	3	3	9	100	300
	Core	19	(3-5)	73	100	1900
Part IV	Environmental Science	1	2	2	100	100
	Soft Skill	1	1	1	100	100
	Value Education	1	2	2	100	100
	Lang. & Others/NME	2	2	4	100	200
	Skill Based	4	3	12	100	400
Part V	Extension	1	1	1	50	50
	Total	**40**		**140**		**3950**

BACHELOR OF COMMERCE (B.Com.)
(With effect from 2017-2018)

SEMESTER I
PAPER - 1
FINANCIAL ACCOUNTING – I

Objective:

To gain knowledge of accounting in general and to understand the system of Financial Accounting.

UNIT - I

Accounting Concepts and Conventions – Accounting Equation – Journal, Ledger and Trial balance, Errors and Rectification of Errors – Bank Reconciliation Statement.

UNIT - II

Final Accounts – Classification of Assets and Liabilities – Preparation of Trading, Profit and loss account and Balance sheet with adjustments.

UNIT - III

Insurance Claim – Loss of Stock – Average Clause (Simple problems) , Average Due Date and Bill of Exchange.

UNIT - IV

Depreciation: Meaning – factors determining Depreciation– Objectives of Providing Depreciation – Causes of Depreciation – Methods of providing Depreciation – Straight Line Method – Diminishing Balance Method .

UNIT - V

Single Entry System – Objectives – Definition – Salient Features – Limitations of Single Entry System – Difference between Single Entry and Double Entry – Ascertainment of Profit – Methods – Net worth Method and Conversion Method (Simple problems) – Differences between Statement of Affairs and Balance Sheet.

(Weightage of Marks = Problems - 80%, Theory - 20%)

Reference Books:

1. M.C.Shukla and T.S.Grewal, Advanced Accounts (Vol.1), S.Chand & Co.

2. R.L.Gupta and V.K.Gupta, Financial Accounting, Sultan Chand & Sons.

3. S.P.Jain and K.L.Narang, Advanced Accountancy, Kalyani Publications, New Delhi, Ludhiana.

4. T.S.Reddy and A.Murthy, Financial Accounting, Margham Publishers, Chennai.

5. S.N.Maheswari, Financial Accounting, Vikas Publications.

PAPER - 2

BUSINESS ORGANISATION

Objective:

To gain knowledge of Business Organisation and its importance.

UNIT - I

Business - Meaning and Types - Profession - Meaning and Importance of Business Organization - Social Responsibilities of Business - Business Ethics.

UNIT - II

Forms of Business organization - Sole Trader - Partnership – Limited Liability Partnership (LLP) - Joint Hindu Family - Joint Stock Companies - Co-operative societies - Public Utilities and Public Enterprises - Public Sector vs. Private Sector.

UNIT - III

Location of industry - Factors influencing location - Size of industry - optimum firm - advantages of large and small scale operation - Limitations of large and small scale operation - Industrial Estates - District Industries Centres (DIC).

UNIT - IV

Stock Exchange - Functions - Types - Working - Regulation of Stock Exchanges in India - Business Combination - Causes - Types - Effects of Combination in India.

UNIT-V

Trade Association - Chamber of Commerce - Functions - Objectives - Working in India.

Reference Books:

1. Y.K.Bhushan, Business organization, Sultan Chand, New Delhi.

2. Prakash & Jagedesh, Business organization & Management.

3. Reddy & Gulshar, Principles of Business Organization & Management

4. Vasudevan & Radhasivam, Business Organization.

5. Business organization & Management, R.N. Gupta, S. Chand & Co. New Delhi.
6. Business Organisation- C.D.Balaji and Dr.G.Prasad, Margham Publications , Chennai.

ALLIED

PAPER - 1

INDIAN ECONOMY - I

Objective:

To enable the students to understand the salient features of India and its occupational structure; to assess the relative share of Agriculture, Industry and Service sector in the economy.

UNIT – I Development and Growth

Features of Indian Economy - Characteristics of Development - Factors responsible for development – Development Vs Growth.

UNIT – II Planning

Planning in India – Meaning, Process and approaches – Five Year Plans – Objectives – Targets and Performances – Objectives of 12th Five Year Plan- NITI AAYOG: Administration and Functions.

UNIT – III Agriculture in India

Role of Agriculture in Indian Economy – Problems of low productivity – Mechanisation – Position – Advantages and Disadvantages in Indian Perspective – Food Problems and Green Revolution.

UNIT – IV Agricultural Marketing

Meaning and Definition – Features – Problems – Regulated Markets – Warehousing Role of Agricultural Prices Commission (APC) – Procurement Policy – Agricultural Credit – Need and Sources.

UNIT – V SSIs and Industrial Sickness

Role of Micro, Small and Medium Enterprises in Indian Economy – Measures to develop MSME – Industrial sickness - Causes and measures to overcome industrial sickness.

Reference Books:

1. Rudar Dutt & K.P.M Sundaram, Indian Economy, S. Chand & Co.,
2. I.C.Dhingra, Indian Economy, Sultan Chand & Sons, New Delhi.
3. M.L. Jhigan, Economics of Development & Planning, Konark Publishers, New Delhi.
4. Dr. S. Sankaran, Indian Economy, Margham Publications, Chennai.
5. Mishra and Puri, Indian Economy, Himalaya Publications.

SEMESTER II

PAPER - 3

FINANCIAL ACCOUNTING - II

Objective:

To gain knowledge of accounting in general and to understand the system of Financial Accounting.

UNIT-I

Branch Accounts – Objects of Branch Accounts – Types of Branches – Dependent Branch – Debtors System - Stock and Debtor System (simple problems)-Dependent Branch-Departmental Accounts – Distinction between departments and branches – Allocation of common expenses – Expenses which cannot be allocated – Inter- departmental Transfer at Cost and at Selling Price (simple problems)

UNIT-II

Hire purchase and Installment Purchase Systems – Calculation of Interest - Default and Re-possession (Hire Purchase Trading Account excluded)- Simple Problems

UNIT-III

Partnership Accounts – Fundamentals – Fixed and fluctuating Capital – Profit and Loss Appropriation Account – Admission of a partner – Adjustment in Profit Sharing ratio – Treatment of Goodwill as per AS 10 – Adjustment for revaluation of Assets and Liabilities – Adjustment for reserves and other accumulated profit and losses – Adjustment for capital (Simple Problems)

UNIT-IV

Retirement and Death of a Partners – Distinction between sacrificing ratio and gaining ratio - Goodwill to be treated as per AS10 – Adjustments in the Profit Sharing Ratio – Adjustment for Revaluation of Assets and Liabilities. (Simple problems)

UNIT-V

Partnership Accounts – Dissolution of Firm – Realisation of Assets and Settlement of Liabilities – Accounting Treatment for Unrecorded Assets and Liabilities – Insolvency of a Partner – Garner Vs Murray —— All Partners Insolvency – Piecemeal Distribution. (Simple problems).

(Weightage of Marks = Problems - 80%, Theory - 20%)

Reference Books:

1. M.C.Shukla and T.S.Grewal, Advanced Accounts (Vol.1), S.Chand & Co.

2. R.L.Gupta and V.K.Gupta, Financial Accounting, Sultan Chand & Sons.

3. S.P.Jain and K.L.Narang, Advanced Accountancy, Kalyani Publications, New Delhi, Ludhiana.

4. T.S.Reddy and A.Murthy, Financial Accounting, Margham Publishers. Chennai.

5. S.N.Maheswari, Financial Accounting, Vikas Publications.

PAPER - 4

BUSINESS COMMUNICATION

Objective:

To enable the students to know importance of communication in commerce and trade and to draft business letters.

UNIT-I

Business Communication – Meaning – Definition - Features of Business Communication – Importance of effective Communication in Business – Classification of Communication – Characteristics and Guidelines of Effective Business Communication.

UNIT-II

Analysis of Business Letters – Basic Principles in Drafting – Appearance, Structure and Layout .

UNIT-III

Various types of Business Letters – Letters of Enquiry – Offers, Quotations, Orders, Complaints and Settlement, Circular Letters, Status Enquiry – Collection Letters – Letters of Application – C.V.– Reference Letters.

UNIT-IV
Business Report – Importance – Characteristics – Types – Reports by Individuals and Committees.

UNIT-V
Business Communication in High-Tech Environment – Introduction –Computers in Communication– Factors determining Modern Means of Communication – Benefits – Obstacles .

Reference Books:

1. Rajendra Pal & J S Korlahali, Essentials of Business Communication.
2. Ramesh and Pattanchetti, Business Communication, R Chand & Co.
3. Dr.K.Sundar, Business Communication, Vijay Nicole Publications, Chennai.
4. Dr.N.Premavathy, Business Communication, Sri Vishnu Publications, Chennai.
5. Dr.N.Premavathy, Business Communication (in Tamil), Sri Vishnu Publications, Chennai.

ALLIED

PAPER – 2

INDIAN ECONOMY – II

UNIT-I

Industrial Finance - Need and sources of Industrial Credit – Financial Institutions IFCI, SFC, ICICI, IDBI, SIDBI – Objectives and Performance - Foreign Direct Investment (FDI) and Foreign Institutional Investors (FII) – Position, Advantages and Drawbacks to India.`

UNIT-II

Public vs. Private Sector - Economic Reforms Phase II (1991 & after) - New Economic Policy – objectives – Liberalization, Privatization and Globalization (LPG) – Meaning, Positive and Negative effects in India.

UNIT-III

Human Resource and Economic Development – Population – Causes and Measures to control Population explosion - Unemployment – Causes and Remedial Measures - Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA).

UNIT-IV

Labour Economics – Trade Unions – Weaknesses – Measures to overcome - Industrial Relations – Significance - Industrial Disputes – Causes and Remedial Measures – Social Security Schemes – National Pension Scheme.

UNIT-V

Foreign Trade and BOP – Role of Foreign Trade in India – Components of Foreign Trade - Balance of Payments - Position - Causes for disequilibrium in BOP - Measures to correct disequilibrium in Balance of payments.

Reference Books:
1. Rudar Dutt & K.P.M Sundaram, Indian Economy, S. Chand & Co.,
2. I.C.Dhingra, Indian Economy, Sultan Chand & Sons, New Delhi.
3. M.L. Jhigan, Economics of Development & Planning, Konark Publishers, New Delhi.
4. Dr. S. Sankaran, Indian Economy, Margham Publications, Chennai.

SEMESTER III

PAPER - 5

CORPORATE ACCOUNTING - I

Objective:
To gain comprehensive understanding of all aspects relating to corporate accounting.

UNIT-I

Issue of Shares – at Par, Premium and Discount – Pro-rata Allotment – Forfeiture and Reissue of Shares. (Simple Problems)

UNIT-II

Issue of Debentures – Redemption of Debentures – Redemption of Preference Shares – Underwriting of Securities. (Simple Problems)

UNIT-III

Profit Prior to Incorporation – Final Accounts of Companies (Managerial Remuneration Excluded) (Simple Problems)

UNIT-IV
Amalgamation, Absorption and External Reconstruction – Including Internal Reconstruction - Purchase Consideration – Methods – ASI4 (Simple problems)

UNIT-V
Liquidation Accounting – Order of Payments – Preferential Payments – Liquidators Final Statement of Account. (Simple Problems)

(Weightage of Marks = Problems - 80%, Theory - 20%)

REFERENCE BOOKS:
1. Shukla M.C.Grewal, T.S.Gupta S.C., Advanced Accounts – S.Chand & Co. Ltd, New Delhi.
2. Gupta R.L. & Radhaswamy M, Sultan Chand & Sons, New Delhi.
3. Jain & Narang, Advanced Accountancy – Kalyani Publishers.
4. Iyengar S.P, Advanced Accounting - Sultan Chand & Sons, New Delhi.
5. Reddy T.S. & Murthy A, Corporate Accounting – Margham Publications, Chennai.

PAPER - 6

BUSINESS LAW

Objectives: To gain a comprehensive knowledge on all aspects of law as applied to business.

UNIT-I

Contract - Formation and Essential Elements of Contract – Types of Contract and Agreements – Rules as to offer, Acceptance and Consideration – Capacity to Contract – Lawful Object and Free Consent – Quasi Contract.

UNIT-II

Performance of Contract – Devolution of Joint Rights and Liabilities – Discharge of Contract – Breach of Contract and Remedies.

UNIT-III

Indemnity and Guarantee – Features and Distinctions – Extent of Surety's Liability – Rights and Discharge of Surety – Bailment and Pledge – Features – Difference – Rights and Duties of Bailor and Bailee.

UNIT-IV

Contract of Agency – Definition and Meaning – Creation – Ratification and Requisites – Rights of Principal and Agent – Personal Liability of Agent – Termination of Agency.

UNIT-V

The Information Technology Act 2000 – Definition- Authentication of electronic Records - Electronic governance- Digital signature Certificates – Cyber Law-concept of cyber space - cyber   law in E – commerce - RTI Act 2005 - definition – Objective of RTI Act

Reference Books:

1. N.D.Kapoor, Business Laws, Sultan Chand & Sons, New Delhi
2. M.C.Dhandapani, Business Laws, Sultan Chand & Sons, New Delhi
3. M.C.Shukla, Mercantile Law, S.Chand & Co., New Delhi
4. R.S.N.Pillai & Bagavathi, Business Laws, S.Chand & Co., New Delhi
5. P.C. Tulsian, Business Laws, Tata McGraw Hill, New Delhi
6. Dr.N.Premavathy, Business Law, Sri Vishnu Publications, Chennai.

PAPER - 7

BANKING THEORY, LAW AND PRACTICE

Objective

To give awareness about Banking and its practical application.

Unit I : An Introduction to Banking

Introduction – Components of Indian Banking System – Banking Structure in India – Definition of Banking – Classification of Banks – Banking System – Universal Banking – Commercial Banking - Functions – Role of Banks in Economic Development-Financial Inclusion.

Unit II : Account opening

Bank Accounts – Types – Steps in Opening Accounts – Savings and Current Accounts – Pay-in-slip Book – Pass Book. Bank Customer – Definition – Relationship – Types – KYC Norms. Bank Lending – Significance – Lending Sources – Principles – Forms of Lending – Loan Evaluation Process – Securities for Lending – Factors Influencing Bank Lending.

Unit III : Negotiable Instruments

Meaning – Characteristics – Nature – Features and Similarities - Types. Crossing – Definition – Objectives – Crossing and Negotiability – Need for Crossing – Types – Persons Eligible to do Crossing – Consequences. Endorsement – Meaning – Definition – Components of Endorsements – Types – Effects – Duration – Rules regarding Endorsement.

Unit IV : Paying Banker

Meaning – Bankers duty – Dishonoring Customers Cheque – Discharge of Paying Banker – Payment of Cheque by Mistake – Material Alteration – Liability of Paying Banker – Statutory Protection – Refusal of Payment. Loans and advances- Principles of Sound lending

Unit V : Recent Trends in Banking System.

Electronic Fund Transfer (EFT) - RBI Guidelines – Benefits of Electronic Clearing Systems E-Cheques – E-Money – Real Time Gross Settlement (RTGS), NEFT- IMPS – Benefits to Banker and Customer – Cheque Truncation – Core Banking Solutions (CBS) – Benefits – Single Window Concepts – Features.

Text Book:

Banking Theory Law and Practice – E. Gordon & K. Natarajan. Himalaya Publishing House New Delhi. Reprint - 2016.

Books for Reference:

1. Kandasami K.P., Natarajan S.and Parameswaran R. – Banking – S. Chand and Co. Ltd., New Delhi (Latest Ed.)
2. P.N. Varshney., – Banking Law and Practice – Sultan Chand & Sons New Delhi-24th Edition.
3. Natarajan S. and Parameswaran R. – Indian Banking – S. Chand and Co. Ltd., New Delhi (Latest Ed.)
4. Vasudevan S.V. – Theory of Banking – S. Chand and Co. Ltd., New Delhi (Latest Ed.)
5. Sundharam and Varshney – Banking Law and practice – S. Chand and Co. Ltd., New Delhi (Latest Ed.)
6. S.N.Mahaeswari, Banking Law and Practice, Kalyani Publishers, Ludhiana
7. B.Santhanam, Banking and Financial System, Margham Publications,Chennai.
8. Dr.S.Gurusamy, Banking Theory, Law and Practice, Vijay Nicole Publications, Chennai

PAPER - 8

BUSINESS STATISTICS AND OPERATIONS RESEARCH – I

Objective:

To understand and apply statistical tools in Business.

UNIT-I

Statistics - Definitions - Scope and Limitations - Collection of Data - Primary and Secondary Data - Questionnaire - Classification and Tabulation - Types of Sampling Methods, Simple Random, Systematic, Stratified and Cluster.

UNIT-II

Measure of Central Tendency - Mean - Median - Mode - Harmonic Mean and Geometric Mean.

UNIT-III

Measure of Dispersion - Range - Quartile Deviation - Mean Deviation - Standard Deviation - Coefficient of Variation - Lorenz Curve.

UNIT-IV

Measure of skewness - Karl Pearson's and Bowley's coefficient of skewness.

UNIT-V

Linear Programming - Formation and Graphical Solution (Simplex Method Excluded).

(Weightage of Marks = Problems - 80%, Theory - 20%)

Reference Books:
1. Dr. S.P. Gupta - Statistical Methods - Sultan Chand.
2. Dr. S.P. Gupta - Business Statistics & Operation Research - Sultan Chand.
3. R.S.N. Pillai & Bhagavathi - Statistics.
4. J.K. Sharma - Business Statistics - Pearson Education.
5. B. Agarwal – Basic Statistics - Wiley Eastern.
6. Hamdy & A. Tahe - Operation Research - Macmillan.

ALLIED

PAPER - 3

BUSINESS ECONOMICS - I

UNIT-I INTRODUCTION

Business Economics - Definition – Features – Scope - Objectives – Role and responsibilities of a business economist.

UNIT-II DEMAND ANALYSIS

Demand – Nature – Features –Determinants – Types – Law of Demand – Assumptions – Exception – Demand Schedule – Demand Curves – Changes in demand.

UNIT-III ELASTICITY OF DEMAND AND DEMAND FORECASTING

Concept of Elasticity – Elasticity of Demand – Types – Demand Forecasting – Different types of Demand Forecasting.

UNIT-IV UTILTIY ANALYSIS

Cardinal – Ordinal – The Law of Diminishing Marginal Utility – Equi- Marginal Utility-Indifference Curve – Indifference Schedule – Indifference Curve – Marginal rate of Substitution – Consumers Equilibrium.

UNIT-V PRODUCTION FUNCTION

Production – Factors of Production – The Law of Variable Proportions – Law of returns to Scale- Economies and Diseconomies of Scale.

Reference Books:

1. Business Economics, K.P.M Sundaram and E.N. Sundaram, Sultan & Chand, New Delhi.

2. Business Economics, S. Sankaran, Margham Publications, Chennai
3. Business Economics – Dr.G.Vinod Kumar,Dr.A.Senthil Rajan and S.S.Maniraja.

4. Managerial Economics, R.L. Varsheny and K.L. Maheshwari, Sultan & Chand. New Delhi.

5. Business Economics, H.L. Ahuja, S.Chand.

SKILL BASED SUBJECT
PAPER :1

MODERN OFFICE MANAGEMENT

Objective:

To enable the students to understand management of office, methods, environment and procedures.

UNIT-I

Modern Office – Functions – Growth of Office Work – Activities of Modern Office – Importance.

UNIT-II

Functions of Office Management – Planning, Organizing, Directing, Motivating, Coordinating and Controlling – Elements of Office Management – Office Manager – Functions, Qualities and Drawbacks.

UNIT-III

Office Accommodation and Layout – Location of Office – Layout and Merits – Open and Private Office – Merits and Demerits – Office Environment.

UNIT-IV

Office Appliances – Importance, Merits and Demerits – Types.

UNIT-V

Record Administration – Objects and Principles – Advantages of Records – Keeping – Filing – Objects – Essentials of Good Filing – Centralized Vs Decentralized Filing – Modern Methods and Classification – efiling-Indexing – Importance and Essentials – Methods and Merits.

Reference Books:

1. R.S.N. Pillai and Bagavathi, Office Management, S.Chand & Co., New Delhi.

2. C.B.Gupta, Office Organization and Management, Sultan Chand, New Delhi.

3. P.K.Ghosh, Office Management– Sultan Chand, New Delhi.

NON-MAJOR ELECTIVE

PAPER - 1

GENERAL COMMERCIAL KNOWLEDGE

Objective:

To enable the students to gain basic knowledge of Trade, Commerce and Industry.

UNIT-I

Meaning of Business, Profession,Commerce, Trade and Industry – Meaning – Scope and Importance of Commerce –Hindrances in the exchange of goods and services – Economic Basis of Commerce.

UNIT-II

Forms of Business Organisation – Sole Trading concern – Partnership Features – Merits and Demerits, Limited Liability Patnership (LLP)

UNIT-III

Joint Stock Company – Features – Memorandum of association and Articles of association – Contents – Prospectus and its Contents – Types

UNIT-IV

Management of Joint Stock Company – Directors – Qualification, Appointment, Removal, Powers and Duties- Company Meetings – Types .

UNIT-V

Co-operative societies – Features, Types - advantages - Public Enterprises-Features and Advantages

REFERENCE BOOKS:
1. Ghosh and Bhushan, General Commercial Knowledge, Sultan Chand & Sons, New Delhi
2. J.C. Bahl & E.R.Dhongde, Elements of Commerce & Business Methods, New Book & Co., Mumbai
3. P.N. Reddy & S.S.Gulshan, Commerce – Principles & Practice, S. Chand & Co., New Delhi
4. J.C. Sinha & V.N.Mughali, A text book of Commerce, R. Chand & Co., New Delhi
5. K.L.Nagarajan, Vinayagam, Radhasamy and Vasudevan, Principles of Commerce and General Commercial Knowledge, S.Chand & Co., New Delhi

SEMESTER IV

PAPER – 9

CORPORATE ACCOUNTING – II

Objective:

To gain accounting knowledge in advanced corporate accounting.

UNIT-I

Valuation of Goodwill – Need – Factors Effecting the Valuation – Methods – Average Profit, Super Profit, Annuity and Capitalization Methods - Valuation of Shares – Need – Factors affecting the Valuation – Net Asset, Yield and Fair Value Methods. (Simple Problems)

UNIT-II

Accounts of Holding Companies – Minority Interest – Cost of Control – Elimination of Common Transactions – Unrealized Profits – Consolidated Balance Sheet (Inter Company Investment Excluded) (Simple Problems)

UNIT-III

Bank Accounts: Rebate on Bills Discounted, Interest on Doubtful Debts, Preparation of Profit and Loss Account and Balance Sheet with Relevant Schedules (New Format) (Simple Problems)

UNIT-IV

Insurance Company Accounts: Life Insurance – Revenue Account – Profit & Loss Account (New Format) – Valuation Balance Sheet (Simple Problems) - General Insurance - Fire and Marine - Revenue Account, Profit and Loss Appropriation Account and Balance Sheet (New Format) (Simple Problems)

UNIT-V
Accounting for Price Level Changes- Introduction – Historical Accounting - Inflation Accounting - Methods of Inflation Accounting – Computation of Gain or Loss on Monetary   Items.

(Weightage of Marks - Problems - 80%, Theory - 20%)

Reference Books:

1. Shukla M.C.Grewal, T.S.Gupta S.C. – Advanced Accounts – S.Chand & Co. Ltd, New Delhi

2. Gupta R.L. & Radhaswamy M. – Sultan Chand & Sons, New Delhi

3. Jain & Narang – Advanced Accountancy – Kalyani Publishers

4. Iyengar S.P. – Advanced Accounting - Sultan Chand & Sons, New Delhi

5. Reddy T.S. & Murthy A. – Corporate Accounting – Margham Publications, Chennai

6. Dr.S.Ganesan and S.R.Kalavathy, Thirumalai Publications, Nagarkoil.

PAPER - 10

COMPANY LAW

Objective:

To gain knowledge about the company law.

UNIT-I

Introduction – Meaning and Definition of a Company – Characteristics of a Company – Advantages – Limitations – Types of Companies – Distinction between a Private Ltd. Company and a Public Ltd. Company. National Company Law Tribunal(NCLT), National Company Law Appellate Tribunal (NCLAT), Special Courts-Salient features of Indian Companies Act-2013

UNIT-II

Formation of a Company – Promotion – Functions of a Promoter – Memorandum of Association – Meaning – Contents – Purpose – Articles of Association – Meaning – Contents – Distinction between Memorandum and Articles.

UNIT-III

Prospectus – Meaning – Requirements of a Prospectus – Conditions for a Prospectus – Objects of Issuing a Prospectus – Contents – Liability for Misstatement – Remedies for Misstatement – Statement in Lieu of Prospectus.

UNIT-IV

Members of a Company – Rights – Liabilities – Termination . Company secretary – Definition - Legal position - Duties – Rights – Liabilities – Qualification – Dismissal.

UNIT-V

Directors of a Company – Eligibility to become a Director – Number of Directorships – Director Identity Number (DIN) - Appointment of Directors – Removal of Directors – Powers, Duties and Liabilities of Directors – Winding up of a Company – Meaning – Methods of Winding up.

Reference Book:
1. N.D.Kapoor, Company Law – Sultan & Chand.
2. Ashok K Bagrial, Company Law, Vikas Publications
3. Avtar Singh , Company Law
4. Kathiresan and Radha, Company law – Prasanna Publishers, Chennai.
5. P.K.Gosh ,Company Law and Secretarial Practice

PAPER - 11

BUSINESS MANAGEMENT

Objective:

To understand the basic principles of Business Management.

UNIT-I

Management – Meaning – Definition – Nature – Importance – Distinction between Administration and Management – Scope – Principles and Functions of Management- Conceptual Idea of Corporate Social Responsibility.

UNIT-II

Planning – Meaning – Nature – Importance – Advantages and Limitations – Process of Planning– Types of Plans – MBO – Forecasting – Decision Making.

UNIT-III

Organising – Meaning – Definition – characteristics – Importance – Types – Authority and Responsibility – Centralization and Decentralization - Departmentation.

UNIT-IV

Staffing – Meaning – Importance Directing – Meaning – Definition – Characteristics – `Directing Process – Span of Supervision – Leadership – Styles of Leadership – Communication.

UNIT-V

Controlling – Definition – Principles – process – Types of Controls – Control Techniques - Coordination.

REFERENCE BOOKS:

1. Koontz, Weihrich and Aryasri, Principles of Management, Tata McGraw hill

2. Dr.H.C. Das Gupta, Principles & Practice of Management & Sahitya Bhawan, Agra

3. Lallan Prasad & S.S.Gulshan, Management principles and Practices & S.Chand & Co.

4. Dr. C.B. Gupta, Business Management –Sultan Chand & Sons

5. Jayashankar, Business Management –Margham Publications, Chennai.

6. L.M. Prasad , Principles and Practice of Management, Sultan Chand and Sons, New Delhi.A

PAPER - 12

BUSINESS STATISTICS AND OPERATION RESEARCH - II

Objective

To understand and apply statistical tools in Business.

UNIT-I

Correlation - Definition - Karl Pearson's Coefficient of Correlation - Rank Correlation - Regression Equations.

UNIT-II

Index Number - Definition - Uses - Unweighted Index Number Simple Aggregate Price Index, Simple Average of Price Relatives Index - Weighted Index - Laspeyre's Paasche, Dorbish Bowley's - Marshall Edgeworth, Fisher Ideal Index - Time and Factor Reversal Test - Cost of Living Index.

UNIT-III

Time Series - Definition and Uses - Components - Semi Average, Moving Average - Method of Least Square - Seasonal Variation - Simple Average Method - Interpolation: Definition - Newton (Advancing Difference Method only) - Lagrange's - Binomial Expansion.

UNIT-IV

Probability - Addition and Multiplication Theorem - Permutation and Combination.

UNIT-V

Transportation (IBFS) and Assignment problem.

(Weightage of Marks = Problems - 80%, Theory - 20%)

Reference Books:
1. Dr. S.P. Gupta, Statistical Methods - Sultan Chand.
2. Dr. S.P. Gupta, Business Statistics & Operation Research - Sultan Chand.
3. R.S.N. Pillai & Bhagavathi, Statistics.
4. J.K. Sharma, Business Statistics - Pearson Education.
5. B. Agarwal, Basic Statistics - Wiley Eastern.
6. Hamdy & A. Tahe, Operation Research - Macmillan.

Allied
PAPER - 4
BUSINESS ECONOMICS - II

UNIT-I SUPPLY ANALYSIS
Meaning – Factors affecting supply - supply schedule – law of supply - supply curve – elasticity of supply and types of elasticity - Factors influencing Elasticity of supply.

UNIT-II COST AND REVENUE ANALYSIS
Break Even Analysis – Cost of production – Kinds of Cost – Total, Average, Marginal cost curves – Relationship of MC to AC – Fixed and variable cost curves –– Cost and output relationship – Revenue – Total, Average and Marginal Revenue.

UNIT-III MARKET STRUCTURE AND PRICING
Market structure – Classification of Market – Perfect Competition, Monopoly, Monopolistic, Oligopoly, Duopoly – Price determination in a Perfect Competition, Monopoly, Monopolistic and Oligopoly Market .

UNIT-IV FACTOR PRICING
Marginal Productivity theory – Assumptions and Criticism – wages - factors to be considered for Real Wages – Theories of Wages .Profit – concept of Profit – Theories of Profit .

UNIT-V BUSINESS CYCLE AND INFLATION
Meaning – Features - Phases of business cycle – Theories - Inflation - Types - Effects - Methods of controlling Inflation.

Reference Books:

1. Business Economics, K.P.M Sundaram and E.N. Sundaram, Sultan & Chand, New Delhi.

2. Business Economics, S. Sankaran, Margham Publications, Chennai

3. Business Economics – Dr.G.Vinod Kumar,Dr.A. Senthil Rajan and S.S. Maniraja.

4. Managerial Economics, R.L. Varsheny and K.L. Maheshwari, Sultan & Chand. New Delhi.

5. Business Economics, H.L. Ahuja, S.Chand.

SKILL BASED
PAPER - II
FINANCIAL SERVICES

Objective:

To enable the students to gain knowledge of business financial services.

UNIT-I

Financial services – meaning – Financial services and economic environment – legal and Regulatory Framework – Financial institutions and other participants in the financial services sector – SWAP Analysis

UNIT-II

Factoring – Types and feature of factoring agreement – Factoring Vs Bills discounting – Services of factor – forfeiting.

UNIT-III

Venture capital – meaning and characteristics – criteria for assistance – schemes and guidelines - Infrastructure financing – assessment of risk – legal aspects.

UNIT-IV

Mutual funds – SEBI Guidelines – Features and types – Management structure and performance evaluation – Growth and recent trends

UNIT-V

Investor services – Credit rating agencies – CRISIL, CARE, ICRA – Services – Criteria for rating – Symbols.

Reference Books:
1. M.Y.Khan, Indian Financial System, Tata McGraw Hill, 2001

2. H.R.Machiraju, Indian Financial System, Vikas Publishing House, 1999

3. B.S. Bhatia & G.S.Bhatre, Management of Capital Markets, Financial Services and Institutions, Deep and Deep Publishers, 2000

4. Dr.S.Gurusamy, Financial Services and Systems, Vijay Nicholes Imprint Pvt. Ltd., 2004 Chennai

5. L.M.Bhole, Finance Institutions and Markets, Tata McGraw Hill, 2002

6. H.Sadhak, Mutual Funds in India, Sage Publications, New Delhi, 1997

7. SEBI Guidelines, Bharat Publication, New Delhi

8. Dr.V.Balu, Merchant Banking & Finance Services, Sri Venkateswara Publication, Chennai.

9. Dr. N. Premavathy, Financial Services and Stock Exchange, Sri Vishnu Publications, Chennai.

NON-MAJOR ELECTIVE

PAPER – 2

PRINCIPLES OF ACCOUNTANCY

UNIT-I

Definition of Accountancy , Book Keeping a n d Accounting Concepts and Conventions – Double entry System – Double Entry Rules – Journal Entries.

UNIT-II

Posting of Journal to Ledger – Balancing of Ledger Accounts – Trial Balance-Errors and Classification of Errors.

UNIT-III

Preparation of Cash Books Single, Double and Three column – Contra Entry – Petty Cash Book – Imprest System

UNIT-IV

Final Accounts – Trading and Profit and Loss account and Balance Sheet – Classification of assets and Liabilities

UNIT-V

Final Accounts –Simple adjustments – Closing Stock, Outstanding and Prepaid Expenses, Depreciation and Provision for Bad and Doubtful Debts.

(Weightage of Marks = Problems - 60%, Theory - 40%)

Reference Books:

1. M.C.Shukla & T.S.Grewal – Advanced Accounts, S.Chand & Co.Ltd., New Delhi
2. S.P.Jain & K.L.Narang – Advanced Accountancy, Kalyani Publications, New Delhi
3. R.L.Gupta & V.K.Gupta – Financial Accounting, Sultan Chand & Sons, New Delhi.
4. T.S.Reddy & A.Murthy – Financial Accounting, Margham Publications, Chennai
5. N.Vinayagam, P.L.Mani, K.L.Nagarajan – Principles of Accountancy, S.Chand Co. Ltd., New Delhi.

SEMESTER V

PAPER - 13

COST ACCOUNTING – I

Objective:

To understand the basic concepts and methods of Cost Accounting.

UNIT-I: Nature and Scope of Cost Accounting

Cost Accounting : Nature and Scope – Objectives, Advantages and Limitations – Financial Vs. Cost Accounting - Costing System - Types of Costing and Cost Classification – Cost Sheet and Tenders – Cost Unit – Cost Centre and Profit Centre.

UNIT-II: Material Purchase and Control

Purchase Department and its Objectives – Purchase Procedure – Classification and Codification of Materials, Material Control: Levels of Stock and EOQ – Perpetual Inventory System, ABC and VED Analysis – Accounting of Material Losses.

UNIT-III: Methods of pricing of Material Issues

Cost Price Methods: FIFO, LIFO, Average Price Methods: Simple and Weighted Average Price Methods, Notional Price Methods: Standards Price, and Market Price Methods

UNIT-IV: Labour Cost Control

Labour Turnover: Causes, Methods of Measurement and Reduction of Labour Turnover – Idle and Over Time – Remuneration and Inventive: Time and Piece Rate – Taylor's, Merricks and Gantt's Task – Premium Bonus System – Halsey, Rowan and Emerson's Plans – Calculation of Earnings of Workers.

UNIT-V: Overheads

Classification of Overhead Costs – Departmentalization of Overheads – Allocation Absorption and Appointment of Overhead Costs – Primary and Secondary Distribution of Overheads – Computation of Machine Hour Rate and Labour Hour Rate.

(Weightage of Marks = Problems 80%, Theory 20%)

REFERENCE BOOKS:

1. S.P.Jain and Narang – Cost Accounting – Kalyani Publishers, New Delhi
2. S.N.Maheswari – Principles of Cost Accounting – Sultan Chand & sons, New Delhi
3. S.P.Iyangar – Cost Accounting – Sultan Chand & Sons, New Delhi
4. T.S. Reddy & Hari Prasad Reddy – Cost Accounting – Margham Publications, Chennai
5. A.Murthy and S. Gurusamy, Cost Accounting, Tata McGraw-Hill Publishing Company Ltd. New Delhi.
6. Tulsian P.C. – Cost Accounting – Tata McGraw Hills

PAPER - 14

MANAGEMENT ACCOUNTING - I

Objective:

To enable the students to gain knowledge in the application of accounting to Management.

UNIT-I

Management Accounting: Definition – objectives - Functions – Advantages and limitations – Distinction between Cost Accounting and Management Accounting – Distinction between Management Accounting and Financial Accounting.

UNIT – II

Financial Statement Analysis – Comparative and Common size statements – Trend Analysis.

UNIT-III

Ratio Analysis : Definition – Significance and Limitations – Classification – Liquidity, Solvency, Turnover and Profitability ratios – Computation of Ratios from Financial Statements – Preparation of Financial Statement from Ratios.

UNIT-IV

Fund Flow Analysis: Concept of Funds - Sources and Uses of Funds – Fund Flow Statement.

UNIT – V

Cash Flow Analysis – Difference between Fund Flow and Cash flow Statement - Cash Flow Statement as Per AS 3.

(Weightage of Marks - Problems - 80%, theory - 20%)

Reference Books:

1. S.N.Maheswari, Management Accounting – Sultan Chand & Sons, New Delhi
2. Manmohan & Goyal, Management Accounting – Sahithiya Bhavan, Agra
3. S.P.Gupta, Management Accounting – Sultan Chand & Sons, New Delhi
4. R.S.N.Pillai & Bhagavathi, Management Accounting – S.Chand & Co. Ltd., New Delhi
5. T.S.Reddy & Hari Prasad Reddy, Management Accounting – Margham Publications, Chennai
6. A.Murthy and S.Gurusamy, Management Accounting, Tata Mc-Graw Hill Publishing Company, New Delhi.

PAPER - 15

INCOME TAX LAW AND PRACTICE - I

Objective:
To enable the students to have a knowledge of law of practice of Income tax.

UNIT – I

Income Tax Act 1961: Basic Concepts and Definitions- Assessee - Assessment year – Income - Person - Previous year-Gross Total Income – Total Income – Residence and Incidence of Tax – Tax free incomes – Capital and revenue.

UNIT – II

Income from salaries: – Salaries – Definition – Features – Perquisites - Valuation and taxability of perquisites – Taxability of allowances – Profits in lieu of salary –Deductions – Computation of taxable Income from Salary

UNIT – III

Income from House Property – Annual value – Determination of Annual Value – Let out House – Deemed to be Let out house– Self Occupied Houses - Deductions – Computation of Income from House Property.

UNIT – IV

Profits and Gains of business or profession – Depreciation and other allowances – Expressly allowed and disallowed deductions – Computation of Business Income – Computation of Professional Income.

UNIT – V
Income tax authorities – CBDT – Powers – Director General of Income Tax – Chief Commissioner of Income Tax – Assessing Officer – Appointment – Jurisdiction – Powers relating to Search and Seizure.

(Weightage of marks: Problems: 80%, Theory: 20%)
Reference Books:
1. Dr.H.C. Mehrotra, Income Tax Law and Practice.
2. Dr. Bagavathi Prasad, Income Tax Law and Practice,
3. Gaur & Narang, Income Tax Law and Practice,
4. B.B. Lal, Direct Taxes,
5. T.S.Reddy & Hari Prasad Reddy, Income Tax Law and Practice, Margham Publications, Chennai.
6. Dr.A.Murthy,Income Tax Law &Practice,Vijay Nicole Imprints Private Limited,Chennai.

SEMESTER V
PAPER –16-
MODERN MARKETING

OBJECTIVE

To Provide basic Knowledge of Concepts, Principles, tools and Techniques of Marketing.

UNIT – I

Nature , Scope,Functions and importance of Modern Marketing;Selling vs Marketing;Marketing Mix,Marketing Environment:Concept, Importance &Components(Economic,Demographic,Technological,Socio – Cultural and Legal).

UNIT – II

Concept, Importance and Bases ,Product Differentiation vs Market Segmentation. Concept and Importance, Product Classification; Concept of Product Mix- Product Addition and Deletion, Product Life Cycle ,New Product Development Process; Consumer Adoption Process.

UNIT - III

Significance , Factors Affecting Price of a Product. Pricing Policies and Strategies.

UNIT – IV

Physical Distribution – Channels Selection- Channels of Distribution – Physical Distribution of Goods – Nature and Importance of Promotion;Types of Promotion :Advertising, Personal Selling and Sales Promotion and their Distinctive Features ;Factors affecting Promotion Mix Decisions.

UNIT V

Recent Development in Marketing – Social Marketing, Online Marketing,Direct Marketing,Services Marketing,Green Marketing,Rural Marketing,Relationship Marketing – Niche Marketing.

Reference Books

1. Michael, J.Etzel, Bruce J. Walker, William J Stanton and Ajay Pandit, *Marketing: Concepts and Cases*. (Special Indian Edition)., McGraw Hill Education

2. Majaro, Simon. *The Essence of Marketing*, Pearson Education, New Delhi.

3. Neeru Kapoor, *Principles of Marketing*, PHI Learning

4. Rajendra Maheshwari, *Principles of Marketing*, International Book House

5. The Consumer Protection Act 1986.

6. Rajan Nair, Marketing, Sultan Chand, New Delhi.

ELECTIVE
(To choose any 1 out of 2)

PAPER – 1
A. FINANCIAL MANAGEMENT

UNIT-I

Financial Management: Objectives and Functions – Scope of Financial Management – Nature and Importance of Finance Functions – Organizing Finance Functions – Functions of Finance Manager – Objectives of Finance Function – Methods and Sources of Raising Finance – Critical Appraisal of the Various Sources of Finance.

UNIT-II

Capital Structure Planning – Optimum capital Structure – Factors determining capital structure – Theories of Capital Structure – NI Approach – NOI Approach.

UNIT-III

Cost of Capital – Components of Cost of Capital – Importance of Cost of Capital - Factors affecting cost of capital – computation of cost of debt, cost of preference shares, cost of equity and weighted average cost of capital

UNIT - IV

Dividend policy – Types of dividends – Factors determining Dividing Policy – Walter's Model – Gordon's Model.

UNIT-V

Working Capital – Gross and Net Working Capital – Factors Determinants of Working Capital – Sources of Working Capital – Estimation of working capital requirements

(Weightage of Marks = Problems - 60%, Theory - 40%)

Reference Books:

1. I.M.Pandey, Financial Management.
2. Dr. S.N.Maheswari, Financial Management.
3. Prasanna Chandra, Financial Management.
4. Dr. A.Murthy, Financial Management, Margham Publications, Chennai.
5. Vyuptakesh Sharan, Fundamentals of Financial Management.

ELECTIVE PAPER-I

B. SERVICES MARKETING

UNIT-I

Growth of the Service Sector - Nature and Concept of Service - Classification of services - Characteristics of Services and their marketing implications - Essential Elements of marketing mix in Service marketing.

UNIT-II

Marketing strategies for service firms with special reference to information, communication, consultancy, advertising, Tourism, Educational Institutions – Health care institutions.

UNIT-III

Product support services - pricing of services - problems of Service quality management - Customer Expectations - innovation in services.

UNIT-IV

Marketing of financial services - nature - types - marketing of insurance - mutual fund - marketing for non - profit firms - Growth of financial services in India.

UNIT-V

CRM - identifying and Satisfying Customer needs - Relationship marketing - Customer Satisfaction - Managing Service Brands.

Reference Books

1. Christopher lovelock, Services Marketing, Pearson Education.

2. E.G. - Bateson, Managing Service marketing - Text and Readings, Dryden press, Hidsdale

3. Philip Kotler and Paul N.Bloom, Marketing professional Services, Prentice hall, New Jersey.

4. Helen Wood Ruffe, Services Marketing, Macmillan India, New Delhi.

5. Dr.S.Gurusamy, Financial and Markets Vijay Nicole imprints private limited, Chennai.

6. Dr.B.Balaji, Services, Services Marketing and Management, S.Chand & Company Ltd., New Delhi.

SKILL BASED PAPER-III

PERSONAL SELLING AND SALESMANSHIP

Objective:

The purpose of this course is to familiarize the students with the fundamentals of personal selling and the selling process. They will be able to understand selling as a career and what it takes to be a successful salesman.

Unit 1

Nature and importance of personal selling, myths of selling, Difference between Personal Selling, Salesmanship and Sales Management, Characteristics of a good salesman, types of salespersons, Career opportunities in selling.

Unit- II

Personal selling Objectives: Types of personal objectives, Market Indices, Sales Potential and sales forecasting, sales forecasting methods, converting industry forecast to company sales forecast, evaluation of forecast.

Unit- III

Buying Motives: Concept of motivation, Maslow's theory of need hierarchy; Dynamic nature of motivation; Buying motives and their uses in personal selling

Unit- IV

Selling Process**:** Prospecting and qualifying; Pre-approach; Approach; Presentation and demonstration; handling of objections; Closing the sale; Post sales activities.

Unit- V

Sales Reports: reports and documents; sales manual, Order Book, Cash Memo; Tour Diary, Daily and Periodical Reports; Ethical aspects of Selling

Reference Books:

1. P.Saravanavel and Sumathi, Advertisement and Salesmanship, Margham Publication, Chennai.
2. Sherlekar, Marketing Mnagement, Himalaya Publishing House
3. C.B.Gupta and Rajan Nair , Marketing Management, Sultan Chand & Sons ,New Delhi.
4. R.S.N.Pillai and Bagawati, Modern Marketing, S.Chand & Sons, New Delhi.

SEMESTER VI
PAPER-17
COST ACCOUNTING-II

To understand the techniques of Cost Accounting.

UNIT-I

Job, Batch, Contract Costing: Job Costing – definition – Features – Procedure – WIP – Cost Accumulation, Batch Costing – EBQ, Contract Costing – Definition, Features, Work Certified and Uncertified – Incomplete Contact – Escalation Clause – Cost Plus Contract – Contract Account

UNIT-II

Process Costing: Definition – Features – Job Vs Process Costing – Process Account – Losses –Inter-process Profit.

UNIT-III

Joint Products and By-products – WIP – Equivalent Units and its Calculation - Closing WIP with or without Process Loss.

UNIT-IV

Operating Costing (Transport Costing): Cost Unit – Cost Classification – Operating Cost sheet.

UNIT-V
Reconciliation of Cost and Financial Accounts.

 (Weightage of Marks = Problems - 80%, Theory - 20%)

REFERENCE BOOKS:
1. S.P.Jain and Narang – Cost Accounting – Kalyani Publishers, New Delhi
2. S.N.Maheswari – Principles of Cost Accounting – Sultan Chand & sons, New Delhi
3. S.P.Iyangar – Cost Accounting – Sultan Chand & Sons, New Delhi
4. T.S. Reddy & Hari Prasad Reddy – Cost Accounting – Margham Publications, Chennai
5. A.Murthy and S. Gurusamy, Cost Accounting, Tata McGraw-Hill Publishing Company Ltd. New Delhi.
6. Tulsian P.C. – Cost Accounting – Tata McGraw Hills

PAPER - 18

MANAGEMENT ACCOUNTING - II

Objective:

To enable the students to gain knowledge in the application of accounting to Management.

UNIT-I

Budgets and Budgetary Control – Nature and objectives of Budgetary Control – Advantages and Limitations of Budgetary Control – Establishing a system of Budgetary Control.

UNIT-II

Preparation of Budgets – Sales Budget – Selling and Distribution Overhead Budget – Production Budget – Purchase Budget – Cash Budget – Flexible Budget – Master Budget.

UNIT-III

Marginal Costing – Absorption Costing – Cost Volume Profit Analysis – Break Even Chart – Differential Costing – Simple Problems – Decision Making Problems – Make or Buy – Key Factor – Selection of a suitable product mix – Export Decisions .

UNIT-IV

Standard Costing and Variance Analysis – Computation of Material, Labour and Overhead Variances.

UNIT-V

Capital Budgeting: Concepts – Nature – Advantages and Limitations – Ranking Investment Proposals – Pay Back Period, ARR, NPV, IRR and Present Value Index.

(Weightage of Marks - Problems - 80%, theory - 20%)

Reference Books:

1. S.N.Maheswari, Management Accounting – Sultan Chand & Sons, New Delhi
2. Manmohan & Goyal, Management Accounting – Sahithiya Bhavan, Agra
3. S.P.Gupta, Management Accounting – Sultan Chand & Sons, New Delhi
4. R.S.N.Pillai & Bhagavathi, Management Accounting – S.Chand & Co. Ltd., New Delhi
5. T.S.Reddy & Hari Prasad Reddy, Management Accounting – Margham Publications, Chennai
6. A.Murthy and S.Gurusamy, Management Accounting, Tata Mc-Graw Hill Publishing Company, New Delhi.

PAPER - 19

INCOME TAX LAW AND PRACTICE – II

Objective:
To enable the students to have a knowledge of law of practice of Income tax.

UNIT – I

Capital gains – Definition of Capital Assets – Kinds of capital Assets – Transfer - Transfer not regarded as Transfer – Short term and long term Capital Gains – Cost of Acquisition - Cost of Improvements – Indexed Cost of Acquisitions – Indexed Cost of Improvements - deductions and exemptions – Computation of short Term Capital Gains and Long Term Capital Gains.

UNIT – II

Income from Other Sources – Specific Incomes chargeable to tax – General Incomes chargeable to tax – Deductions – Interest on Securities - Bond washing transactions – Computation of Income from other Sources.

UNIT – III

Aggregation of income – Deemed Incomes - Set off and carry forward of losses – Clubbing provisions and their implications – Deductions available from Gross Total Income.

UNIT – IV

Assessment of individuals and Firms – Computation of Total Income of Individuals and Firms –Determination of Tax Liability.

UNIT –V

 Assessment Procedure – Filing of Returns- efiling of returns – Permanent Account Number (PAN) – Types of
Assessment – Self, Provisional, Regular, Best Judgment and Reassessment.

(Weightage of Marks – Problems – 80% and Theory 20%)

Reference Books:

1. Dr.H.C. Mehrotra, Income Tax Law and Practice.
2. Dr. Bagavathi Prasad, Income Tax Law and Practice,
3. Gaur & Narang, Income Tax Law and Practice,
4. B.B. Lal, Direct Taxes,
5. T.S.Reddy & Hari Prasad Reddy, Income Tax Law and Practice, Margham Publications, Chennai.
6.   Dr.A. Murthy,Income Tax Law and Practice,Vijay Nicole Imprints Private Limited ,Chennai

ELECTIVE (To choose any 1 out of 2)

PAPER – 2
A. PRACTICAL AUDITING

Objective:
To gain knowledge of the principles and practice of auditing.

UNIT-I

Meaning and Definition of Auditing – Nature and Scope of Auditing – Accountancy and Auditing, Auditing and Investigation – Objectives of Auditing – Limitations of Audit – Advantages of Audit – Classification of Audit

UNIT-II

Meaning and Definition of Audit Programme – Advantages and Disadvantages – Audit File, Audit Note Book, Audit Working Papers – Purposes and Importance of Working Papers – Internal Check – Meaning, Object of Internal Check – Features of Good Internal Check System – Auditors duty with regards to Internal Check System – Internal Check and Internal Audit.

UNIT-III

Vouching – Meaning – Objects – Importance of Vouching – Meaning of Voucher – Vouching of Cash Receipts and Vouching of Cash Payments – Vouching of Trading Transactions.

UNIT-IV

Verification and Valuation of assets and liabilities – Meaning and objects of verification – Vouching and verification – Verification and Valuation of different kinds of Assets and Liabilities.

UNIT-V

The Audit of Limited Companies – Necessity of Company Audit – Qualification and Disqualification of Auditors – Appointment – Removal – Remuneration – Status of Auditors – Rights – Powers – Duties and Liability of Auditors – Auditor's Report – Importance and Contents.

Reference Books:
1. B.N. Tandon, Sultan Chand – A handbook of practical auditing
2. B.N. Tandon, Sudharsanam, Sundharabahu – S Chand – Practical auditing
3. Sharma, Sahitya Bhavan, –Auditing Agra
4. Dr.N.Premavathy, Practical Auditing, Sri Vishnu Publications, Chennai.
5. Dr.N.Premavathy, Practical Auditing (in Tamil), Sri Vishnu Publications, Chennai.

PAPER - 2

B. Customer Relationship Management

UNIT I

Introduction to Customer Relationship Management – Emergence of Relationship Marketing – Distinction between Traditional Marketing and Relationship Marketing – Six Market Model – Three Cornerstones of CRM – CRM Survey Design – Advances of CRM – Types of Customer Relationship Programmes – Scope for CRM.

UNIT II

Customer Relationship – Categorising Relationship – The Relationship Life Cycle – Customer Acquisition – Customer Retention – Relationship Stages – Relationship Longevity – Know Your Customer (KYC) – CRM Business Transformation Process – Integration of CRM with ERP – Data Warehousing .

UNIT III

The analyzing phase of Relationship Marketing - Target Planning – Customer Segmentation in Relationship Marketing – Customer Loyalty – Relationship Marketing – Customer Satisfaction Process – Customer Partnership.

UNIT IV

Implementing Relationship Marketing Programmes – Strategy, Structure and Systems – The McKinsey 7 'S' Framework – Ending Relationships – Total Quality Management (TQM) – Shared Values, Staff, Skills and Styles of Implementing RM programmes.

UNIT V

Monitoring and controlling relationships – Approaches – Measures of Relationship Success – Satisfaction – Relationship Returns measuring financial performance – Complaints analysis and handling – Service Recovery – Service quality – The GAPS Model for managing service quality – Technology for Relationship Marketing – Criteria for creating value for customers.

Reference Books:
1. Customer Relationship Management – Dr.S.Sheela Rani, Margham Publications, Chennai.
2. Customer Relationship Management: A Strategic Approach to Marketing , Kaushik Mukerjee, PHI Learning Pvt. Ltd.
3. Customer Relationship Management; A Databased Approach, V.Kumar, John Wiley & Sons

ELECTIVE
(To choose any 1 out of 2)
PAPER - 3

A. HUMAN RESOURCE MANAGEMENT

UNIT I

Nature and scope of HRM – personnel Management and HRM – Functions of HRM – Functions of HR Manager – HRM as a profession – Indian perspective.

UNIT-II

Human Resource Planning – Recruitment – Internal and External Sources of Recruitment – Selection – Methods of Selection – Use of various tests – Interview techniques in selection – Induction – Placement.

UNIT-III

Training-Objectives- methods – Techniques – Identification of training needs.

UNIT-IV

Job satisfaction – Motivation (Maslow's and Two Factor Theory only) – Performance Appraisal – Methods – Compensation – Incentives – Monetary and Non-Monetary.

UNIT-V
Transfer – Promotion and Termination of Services – Career Development – Monitoring

REFERENCE BOOKS:
1. Aswathappa, Human Resource and Personnel Management.
2. C.B. Memoria, Personnel Management
3. C B Gupta, Human Resource Management
4. L M Prasad, Human Resource Management
5. Dr.K.Sundar & Dr.J.Srinivasan, Human Resource Development, Margham Publications, Chennai.
6. Dr.K.Sundar & Dr.J.Srinivasan, Human Resource Management, Vijay Nicole Publications, Chennai.
7. J. Jayasankar, Human Resource Management, Margham Publications, Chennai.

ELECTIVE PAPER-3

B. SALES AND ADVERTISING MANAGEMENT

UNIT-I

Sales management-Meaning and Scope-Functions Sales and Planning-Sales policy-Sales organization-Sales Territories-Sales Quota-Selling process-Responsibilities of Sales manager

UNIT-II

Need for sales force- Recruitment and Selection of sales force-Training of salesmen-Qualities of a Good salesman

UNIT-III

Advertising-Scope and Function- Need for Advertising classification-Advertisement Planning and Organization-Ethical Issues in Advertising

UNIT-IV

Advertising Media- Advertising Copy- Role of Media-Types of Media-Merits and Demerits-Media Research- Evaluation and Effectiveness of Advertising.

UNIT-V

The Advertising budget - Advertising Agencies - Types of Legal framework of advertising-Self regulation of Advertising.

Reference Books

1. Ramasamy : V S Marketing Management, Macmillan
2.   Davar: Salesmanship and Advertising
3.   Pillai and Bagavathi: Salesmanship, S.Chand & Sons, New Delhi.
4. Richard R Still and Edward W Gundiff- Sales management- Prentice Hall
5. P.Sravanavel, Advertisement and Salesmanship, Margham Publications, Chennai.

SKILL BASED

PAPER – 4

ENTREPRENEURIAL DEVELOPMENT

Objective:

To encourage students to become entrepreneurs.

UNIT-I

Meaning of Entrepreneur – Entrepreneur and Enterprise – Entrepreneur and Manager – Entrepreneur and Intrapreneur – Qualities (Traits) of True Entrepreneur – Characteristics of Entrepreneur – Types of Entrepreneurs – Functions of an Entrepreneur.

UNIT-II

Establishing an Enterprise – Project Identification – Selection of the Product – Project Formulation – Assessment of Project Feasibility – Preparation of Project Report – Selection of Site (Location).

UNIT-III

Selection of Types of Organization – Sole Proprietorship – Partnership – Limited Liability Partnership - Joint Stock Company – Factors Influencing the Choice of Organization – Sources of Project Finance – Sources of Long Term Finance – Sources of Short Term Finance.

UNIT-IV

Incentives and Subsidies – Meaning – Need and Problems – Incentives for Development of Backward Area – Incentives for SSI Units in Backward Areas – Subsidies and Incentives in Tamil Nadu.

UNIT-V

Women Entrepreneurs – Concept – Functions and Role – Problems of Women Entrepreneurs – Suggestions for Development of Women Entrepreneurs.

Reference Books:

1. C.B. Gupta, Entrepreneurship development in India – Sultan Chand

2. S.S. Khanka, Entrepreneurial Development, S. Chand & Co., New Delhi.

3. Gupta C.B and Srinivasan N.P. Entrepreneurial Development, Sultan Chand & Sons, New Delhi.

4. P Sarvanavel, Entrepreneurial development – Ess Pee kay Publishing House.

5. Jaswer Singh Saini, Entrepreneurship Development, Deep and Deep publications, New Delhi.

6. Jayashree Suresh, Entrepreneurial Development –Margham Publications, Chennai.

MASTER OF COMMERCE (M.Com.)

(With effect from 2017-2018)

The Course of Study and the Scheme of Examination

S.NO.	Study Components Course Title		Ins. hrs /week	Credit	Title of the Paper	Maximum Marks		
						CIA	Exam	Total
SEMESTR-I								
1	MAIN	Paper-1	6	5	Accounting for Managerial Decision	25	75	100
2	MAIN	Paper-2	6	5	Business Environment	25	75	100
3	MAIN	Paper-3	6	4	Advanced Business Statistics	25	75	100
4	MAIN	Paper-4	6	4	Modern Marketing Management	25	75	100
5	ELECTIVE	Paper-1	6	3	(to choose 1 out of 2) A. Computer Applications in Business B. Advanced Financial Management	25	75	100
			30	21		125	375	500
SEMESTER II						CIA	Exam	Total
6	MAIN	Paper-5	5	4	Advanced Corporate Accounting	25	75	100
7	MAIN	Paper-6	6	4	Human Resource Management	25	75	100
8	MAIN	Paper-7	6	5	Quantitative Techniques for Business Decisions	25	75	100
9	MAIN	Paper-8	6	5	Consumer Behaviour	25	75	100
10	**Compulsory Paper**		2	2	**Human Rights**	25	75	100
11	ELECTIVE	Paper-2	5	3	(to choose 1 out of 2) A. E-commerce B. Bank Management	25	75	100
			30	23		150	450	600

S.NO.	Study Components		Ins. hrs /week	Credit	Title of the Paper	Maximum Marks		
	Course Title							
	SEMESTER III					CIA	Exam	Total
12	MAIN	Paper- 9	6	5	Advanced Cost Accounting - I	25	75	100
13	MAIN	Paper-10	6	5	Indirect Taxation	25	75	100
14	MAIN	Paper-11	6	5	Security Analysis and Portfolio Management	25	75	100
15	MAIN	Paper-12	6	5	Income Tax Law and Practice	25	75	100
16	ELECTIVE	Paper-3	6	3	(to choose 1 out of 2) A. Customer Relationship Management B. Services Marketing	25	75	100
			30	**23**		**125**	**375**	**500**
	SEMESTER IV					CIA	Exam	Total
17	MAIN	Paper-13	6	5	Advanced Cost Accounting – II	25	75	100
18	MAIN	Paper-14	6	5	Research Methodology	25	75	100
19	MAIN	Paper-15	6	5	Total Quality Management	25	75	100
20	MAIN	Paper-16	6	5	Income Tax and Tax Planning	25	75	100
21	ELECTIVE	Paper-4	6	3	(to choose 1 out of 2) A. Logistics and Supply Chain Management B. Project	25	75	100
			30	**23**		**125**	**375**	**500**

Subject	Papers	Credit	Total Credits	Marks	Total marks
MAIN	16	4-5	76	100	1600
ELECTIVE	4	3	12	100	400
COMPULSORY PAPER	1	2	2	100	100
Total	**21**	**-**	**90**	**-**	**2100**

SYLLABUS   (With effect from 2017-2018)

SEMESTER I

PAPER 1

ACCOUNTING FOR MANAGERIAL DECISION MAKING

Objectives
- To make the students understand the managerial aspect of accounting and.
- To make the students to be familiar with Accounting for Managerial Decision Making.

Unit-I:
Meaning- Scope- importance - Capital Budgeting: pay-back period method- ARR method- Discounted Cash flow methods- N.P.V method - profitability index method.

Unit-II:
Steps in Ratio analysis- advantages – classification of Ratios – profitability Ratio – Turnover Ratios or Activity Ratio- Solvency Ratio or Financial Ratio.

Unit-III:
Meaning- Importance or uses of Fund flow statement- Limitations of funds flow statement- Working capital statement or Schedule of changes in working capital - preparation of fund flow statement- Cash flow statement: - meaning of cash and cash equivalent – Preparation of cash flow statement (AS3).

Unit-IV:
Meaning – Definition- Classification of Budget- Sales Budget- Production Budget- Materials Budget- labour Budget- Overhead Budget- Cash Budget – Flexible budget.

Unit-V:
Meaning –Definition - Working capital management – Types - Estimation of working capital requirements

Note : Problems: 80%   Thoery:20%

Text Book

1. Jain & Narang, Advanced Cost & Management accounting, Kalyani publishers, Ludhiyana.

Reference Books
1. Maheswari S.N. Advanced Management accounting, Sultan Chand & sons, New Delhi.
2. Hingoroni & Ramanathan, Management Accounting, Sultan Chand & sons, New Delhi.
3. Anthony, Robert, Management Accounting, Richard Irwin Home Wood, Illinois.

4.   Batty J. Advanced Management Accounting, McDonald & Evans, London

PAPER-2

BUSINESS ENVIRONMENT

UNIT-I
Business Environment**:** Cultural, social, political, technological, economic and legal environment - scanning - techniques of environmental forecasting - SWOT - Internal environment - their impact on policy formulation.

UNIT-II
Economic reforms in India - Liberalization - privatization and globalization - Competitive Strength of Indian industry - Impact of liberalization policy on different sectors - Foreign Investments policy in India.

UNIT-III

Multi-national corporations - Their participation in India - Their strategies, competitive strengths policies and performance.

UNIT-IV
Business policy and corporate strategy: Policies; Strategies and Tactics; Policies and procedures - Corporate strategy: alternatives - variations - Strategic choice, implementation.

UNIT-V
Business ethics and social responsibilities - relationship between business and society - Corporate power social accountability - Ethical issues and values in business - Corporate Social policies - issues and challenges - Ecological and sssenvironmental issues.

Reference Books

1. Wheelen, Concepts of Strategic Management and Business policy, 8th Ed. Pearson Education, New Delhi, 2002.
2. William Gluck & L R Jauch, Business Policy & Strategic Management,McGraw-Hill 2001.
3. Kazhmi Azhar , Business Policy, TMH,2002.
4. Gupta, Liberalisation - its impact on Indian Economy, Macmillan, 2002.
5.Business Environment ,Vijay Nichols,Chennai.

PAPER - 3

ADVANCED BUSINESS STATISTICS

Objective

To apply statistical techniques for interpreting and drawing conclusion for business problems.

UNIT-I

Partial correlation-Partial correlation coefficient-Partial correlation in case of four variables-Multiple correlation-Multiple regression.

UNIT-II

Sampling- sampling methods- sampling error and standard error- relationship between sample size and standard error.

UNIT-III

Testing hypothesis- testing of means and proportions-large and small samples- Z test and t test.

UNIT-IV

Chi square distribution- Characteristics and application- test of goodness of fit and test of independence- Test of Homogeneity

UNIT-V

F distribution- testing equality of population variances- Analysis of variance-one way and two way classification.

Note: The proportion between theory and problems shall be 20:80

Text Book;

1. S P Gupta, Statistical methods, Sultan Chand & Sons, 2000, New Delhi

Reference Book

1. D C Sancheti and V K Kapoor, Business statistics, Sultan Chand and sons, New Delhi

2. J.K.Sharma, Business Statistics-Pearson Education

3. Richard I Levin and David S. Rubit, Statistics for management, 7th Edition,Pearson education, New Delhi, 2002

4. Business statistics and operations research, Dr D Joseph Anbarasu,Lintech press Trichy

PAPER – 4

MODERN MARKETING MANAGEMENT

UNIT -1

Concept of Marketing: Evolution of Marketing Concept – Changing Concepts of Marketing – Role of Marketing in Business – Inter relationship between Marketing and Other functional areas – Marketing environment variables- Micro and Macro.

UNIT – 2

Market Segmentation – Market Segmentation Strategies – Target Marketing -Target market selection and strategies – Positioning – concept, bases and process- Consumerism – Consumer Rights – Consumer Protection Council – Functions.

UNIT – 3

Marketing mix – Product Decision – Product concept and Classification – Major Product decisions; New product Development – Pricing Decisions: Objectives of Pricing ;Factors affecting price of a product: procedure for setting price; Pricing Policies and strategies

UNIT-4

Distribution Decisions :Channels of Distribution – Concept and importance – Different types of distributions, middlemen and their functions. Promotion Decisions: Meaning and importance of Promotion; Communication process – Promotion tools and their Effectiveness; Determining optimal promotion Mix; Promoting through internet

UNIT – 5

Recent Trends in Marketing – Viral Marketing – Customer Relationship Marketing – Green Marketing – Online Marketing – Rural Marketing – Impact of Multi – nationals on retail marketing.

Reference Books

1.Stanton W.J.et.al.,-Fundamentals of Marketing ,McGraw Hill,New York,1991

2.Philip Kotler ,Marketing Management – Analysis Planning ,and Control ,Prentice Hall of India ,New Delhi,1996.

3.Ramaswami and Namakumari – Marketing Management – Analysis,Planning ,and Control,Prentice Hall of India,New Delhi,1996,

4.Christopher Lovelock ,Services Marketing,4th Edition,Pearson Education ,New Delhi,2002.

5.C.B Mamoria and R.K.Suri Marketing Management ,Kitab Mahal,New delhi,2003

ELECTIVE PAPER-1

A. COMPUTER APPLICATIONS IN BUSINESS

Objective:

To make the students to understand the importance of computers in business applications and learn the fundamental aspects of hardware and software components

Unit -1

Computer: Characteristics, Advantages, Limitations, Types and applications. Role of information in business - Types of information and information systems; Users of information system and information technology - Limitations of Information Technology.

Unit –2

Utility Software – Virus, Worms and antivirus software: System Software: Operating system - Overview, Functions of OS, Types of OS and their advantages and disadvantages.

Unit – 3

Spreadsheet: Basic Operations; Formula Copying, Moving data from selected cells, Handling operations in formulae, Rearranging Worksheet. Organizing Charts and graphs, Graphical representation of data.

Unit – 4

Growth of internet, Owner of Internet, Anatomy of Internet, Basic Internet Terminology, Net Etiquette, World Wide Web, Internet Protocols, Usage of Internet to society, Search Engines.

Unit – 5

E-Commerce: Introduction, Business Models for E-Commerce; E-Marketing: Online Marketing, E-Advertising, Marketing Analysis and issues; E-Payment System: Fundamentals

Text Book:

- Leon, (2006), Introduction to computers, Vikas Publishing House Pvt. Ltd., New Delhi.
- Alexis Leon and Mathew Leon, (2005), Introduction to computers with Ms Office 2000, TMH, New Delhi.

Reference Books:

- SrinivasaVallaban SV, (2005), Computers in Business, Sultan Chand and Sons, New Delhi.
- Sanjay Saxena, (2005), MS Office for Everyone, Vikas Publishing House Pvt Ltd, New Delhi.
  Note: Latest Edition of Text Books may be used.

ELECTIVE PAPER -1
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B.   ADVANCED FINANCIAL MANAGEMENT

UNIT I

Financial Management: Objectives and Functions – Scope of Financial Management - Role of Finance Manager – Risk-return trade off – Time value of money.

UNIT-II

Capital Budgeting: Features and Objectives – Need and Significance of Capital Budgeting - Capital budgeting process – Methods of capital expenditure appraisal: Payback period, Accounting rate of return, Net present value, Internal rate of return, Profitability Index – Risk Analysis in Capital Budgeting.

UNIT-III

Cost of Capital – Components of Cost of Capital – Importance of Cost of Capital - Factors affecting cost of capital – computation of cost of debt, cost of preference shares, cost of equity and weighted average cost of capital.

UNIT-IV

Capital Structure Planning – Optimum capital Structure – Factors determining capital structure – Theories of Capital Structure – NI Approach – NOI Approach - MM Approach – Dividend policy – Types of dividends – Factors determining Dividing Policy – Walter's Model – Gordon's Model – MM Hypothesis.

UNIT-V

Working Capital Management – Definition– Types of Working Capital – Significance of Working Capital – Sources of Working Capital – Factors affecting working capital requirements – Forecasting working capital requirements – Cash Management – Inventory Management.

Note: Problems 60% and Theory 40%
Text Books

1. I. M. Pandey, Financial Management, Vikas Publishing, New Delhi, 2009

2. Khan M.Y. and Jain P.K.: Financial Management - Text and Problems, New Delhi, Tata McGraw Hill Publishing Co., 6th edi, 2012

3. Chandra Prasanna: Financial Management - Theory and Practice, New Delhi, Tata McGraw Hill Publishing Co., 4th ed., 1997

4. Sheeba kapil, Financial Management, Pearson Education, New delhi, 2009 .

SEMESTER- II

ADVANCED CORPORATE ACCOUNTING

Objectives

The primary objective of this subject is to enlighten the students the theoretical aspects of different topics and special attention to chapters like, Holding Companies, Bank and Insurance Company accounts.& HR accounts.

UNIT-I

Accounts of Banking Companies - Legal Provisions - Capital Adequacy Norms - Rebate on Bills Discounted - Asset Classification and Provisioning - Preparation of Final accounts.

UNIT-II

Insurance Company Accounts - Nature of Insurance Business - Distinction between Life and Non Life Insurance - Accounts of Life Insurance Business - Accounts of General Insurance Business - IRDA Regulations Regarding Preparation of Financial Statements.

UNIT- III

Holding Company Accounts - Consolidated Financial Statements - Consolidation of balance Sheets and Profit and Loss Accounts.

UNIT-IV

Liquidation of Companies – Order of Payment – Secured Creditors – Preferential Creditors – Statement of Affairs – Liquidator's Final Statement of Account.

UNIT-V

Human Resource Accounting - Need and Development - Importance of Human Resource Accounting - Objections against Human Resource Accounting - Human Resource Accounting in India. Corporate Social Reporting - Concept and objectives of social responsibility.

Problems:80% Thoery:20%
ReferenceBooks

1. M C Shukla and T S Grewal, Advance accounts, S.Chand & Co New Delhi
2. Anjan Bhattacharya & Subrata Mukerjee, Advanced Practical Accounts, S. Chand & Co., New Delhi.
3. Advanced Corporate Accounting,Jain and Narang kalyani publication,
4. Advanced Corporate Accounting,Reddy & Moorthy,Margham Publications.

PAPER 6

HUMAN RESOURCE MANAGEMENT

UNIT-I

Human Resource Management – Objectives and Importance – Functions and Scope of HRM – Qualities of HR Managers –Changing role of HR managers - HR functions and Global Environment. -HRIS

UNIT-II

HR Planning Process - Recruitment and selection– Selection tests and interviews- Training and Development-Methods.

UNIT-III

Performance Appraisal – Objectives – Methods– Uses. Job Evaluation – wage and salary Administration – Monetary   and Non monetary Incentives – Promotion – Transfer- Demotion

UNIT-IV

Wage and Salary Administration: Objectives and Principles – Employee Welfare – Job Evaluation – Organizational Conflict – Causes – Types of Conflict – Conflict Management - Counseling.

UNIT-V

Recent Trends in HRM – HRM Research and Audit – e-HRM – Balance Score Card – Knowledge Management – Emotional Intelligence – Talent Management.

REFERENCE BOOKS

1. C.B. Mamoria, S.V. Gankar, Human resource management, Himalaya Publishing House, Mumbai, 2006

2. Cynthia D. Fischer, Lyle F. Schoenfeldt, James B. Shaw Human Resource Management Biztantra, New Delhi, 2004

3. Gary Dessler, Biju Varkey, Human Resource Management Pearson Education, Delhi, 2009

4. Rao .P.L, Comprehensive human Resource management, Excel Books, new Delhi, 2006

5. Subba rao, P., Personal and Human resource Management, Himalaya Publishing House, Mumbai, 2004.

6. Dr.K.Sundar & Dr.J.Srinivasan, Human Resource Management, Vijay Nicole Publishers, Chennai

7. P. Subba Rao, Essentials of Human Resource Management & Industrial Relations, Himalaya Publishers, Mumbai

PAPER – 7

QUANTITATIVE TECHNIQUES FOR BUSINESS DECISIONS

UNIT – I

Concept and scope of Operation Research – Development of Operations Research – Phases of Operation Research – Models in Operations Research.

UNIT - II

Linear Programming – Methods of solution – Graphical and Simplex Methods of Solution.(simple Problems Only)

UNIT- III

Transportation model – Definitions – Formulation and Solution of Transportation models – North West Corner – MMM-VAM.

UNIT- IV

Assignment model – Definitions- Formulation and solution of Assignment Models – Simplex and Hungarian Method.

UNIT – V

Inventory models – General concepts and definitions – Various cost concepts – The technique of inventory Control – EOQ models.

Note: Problems 80% and 20%

Text Books
1. P.R.Vittal,Operations Research,Margham Publications,Chennai
2. Kalavathi,Operations Research.

Reference Books
1. J.K. Sharma,Mathemetical Models in Operation Research,TMH publishers.
2. Ramani,Operations Research.

CONSUMER BEHAVIOUR

Objectives:
- To make a student understand consumer behavior and the factors affecting it.
- To help students learn various models of consumer behavior.

UNIT-I

Dimensions of consumer behavior – concepts and need for studying consumer behavior – factors influencing consumer buying behavior – consumer buying process.

UNIT-II

The Economic Model – Learning Model –Psychological Model - Sociological Model – The Howard Sheth Model of buying behavior– Blackwell Model .

UNIT-III

Introduction – Evolution of Consumerism – How did Consumerism originate? –Unique Problems of Indian Consumers – Consumer Orientation – Consumer Exploitation in India – Major Problems of Consumers Exploitation Enactments – CarlillVs Carbolic Company – Consumer Protection Act 1986 – Rights of Consumers.

UNIT-IV

Definition and Meaning of group – types of groups relevant to consumer behavior – Family life cycle – Friendship group – Formal social clubs – Shopping friend's group – Work group – Rural consumer behavior.

UNIT-V

Working towards Customer Satisfaction –Sources of Customer Satisfaction – Consumerism – Consumer Protection Difficulties and Challenges in Predicting Consumer Behavior.

Reference Books

1. Suja and Nair, Consumer Behavior in India Perspective, Himalaya Publishing House.
2. Philip Kotler, Kevin and Lane Keller, Marketing Management ,Pearson Education.
3. PillaiBagavathi R.S.N, Modern Marketing ,S.Chand, New Delhi.
4. WillianStanton , Marketing Management .
5. Loudon and Della Bitta, Consumer Behavior Concept and Applicationd, Tata Mcgraw Hill.
6. Gupta and Sumitra Pal S. L, Consumer behavior in Indian Perspective, Sultan chand and Sons.

A .E-Commerce

Objective:

To provide technical knowledge about the applications of E-Banking and E-Commerce

Unit I:

E-Commerce - Concept - Elements - E-Commerce in Indian Scenario - Economic potential of E-Commerce - M-Commerce - Implementation of E-Commerce - Creation of Website - Technology - Constraints in Implementation - Advantages of E-Commerce - Business models of E-Commerce - B2B, B2C, C2B, G2B and E-Governance.

Unit II:

Evolution of Internet - Growth - Internet Governance - Dynamics of Internet Banking - Internet Portals - a new way to Bank - Net Telephony - Advertisement and Marketing through Internet – Banking Management Information System - importance – Difference between Drive Protection system and Management information System.

Unit III:

Electronic Cheques and Other E-Payment Channels - Banking network in online commerce - Electronic Cheques, Cash, Purse, Electronic Credit - Smart Cards - SWIFT – Operational Risks and Legal Issues with Electronic cash.

Unit IV:

Security Aspects of E-Banking - Physical Vs Electronic security - Data security - Cryptography - Key Secrecy - Digital Signature - Creation and Security - Firewall - Types.

Unit V:

Model of E-Commerce for Implementation in a Public Sector Banks - Level of Computerization of Banks - Challenges before Public Sector Banks - Impact of Technology in Banking Sector - Proposed Model of E-Commerce for Implementation in a Public Sector Banks.

Reference Books:

Bhasin T.M. Tarun Offset, Delhi, Reprint – 2013

Dr. K. Abirami Devi and Dr. M. Alagammai - E- Commerce - Margham Publications, Chennai. Reprint 2016

ELECTIVE PAPER -2
B. BANK MANAGEMENT

UNIT-I

Banking structure in India - banking functions and services - Foreign commercial banks - Private commercial banks - capital adequacy.

UNIT-II

Principles of lending - financial adequacy assessing the borrower - project appraisal - structural and Infrastructural analysis - legal formalities - follow up loans, asset management companies.

UNIT-III

Non Performing Assets (NPAs) - Early Warning Signals - Management of NPAs- Remedies - Available - Recent Measures - loan recovery tribunals - Provisions of Revenue Recovery Act

UNIT- IV

Investment management - priorities in allocation of bank funds - Investment in Governments securities - maturity and yield - quality and diversification, profitability management - profit planning

UNIT-V

Traditional Banking vs. E-Banking - facets of E-Banking - Internet Procurement –
E- Banking Transaction - Electronic Delivery Channels - Truncated Cheque - Complete Centralized Solution - Features of CCS - Advances of E-Banking - Constraints in E-Banking - Security Measures.

Reference books

1. Varshney, PN. Banking Law & Practice, Sultan Chand, New Delhi.

2. S.N.Maheswari, Banking Law & Practice, Ludiana, Kalyani Publications.

3. Vasant Desai, Principles of Bank Management, Mumbai, Himalaya Publications.

4. K.Subramanian, Banking Reforms in India, TMH, New Delhi.

5. Joseph Sinkey, Commercial Bank Financial Bank Financial Management, Pearson Education(Prentice Hall)

6. E.Gordon and Dr. K. Natarajan, Banking Theory Law and Practice – Himalaya Publishing House.

PAPER - 9

ADVANCED COST ACCOUNTING -I

Objective:

The aim of the cost accounting is to acquaint the students with various concepts, methods of costing and decision making

UNIT-I

Nature and significance of cost accounts-Definition of Costing, Scope, Objectives, Functions and limitations of cost accounting-Installation of costing system – Difference between Cost and Financial Accounting – Cost and Management Accounting.

UNIT – II

Elements of Cost- Cost centre and profit centre-Preparation of Cost sheet, tender or quotations.

UNIT – III

Job Costing – Features of Job Costing - Batch Costing –Determination of EOQ or Economic Lost Size - Contract Costing -Preparation of contract account –Distinction between Job costing and Contract Costing – System of recording cost - Cost plus contract and escalation clause.

UNIT – IV

Reconciliation of Cost and Financial Accounts – Need for Reconciliation – Causes for Disagreements in Profits – Procedure for Reconciliation – Types of Problems.

UNIT – V

Operating or Service Costing – Operating costing in Service Industries – Transport Costing – Power House – Costing for Cinema Theatre and Lodging Houses.

Problems:80% Thoery:20%

Reference Books
1. S.P. Jain and K.L. Narang-Cost accounting-Kalyani Publishers-New Delhi.

2. B.K. Bhar- Cost Accounting-Academic publishers, Calcutta

3. T.S.Reddy and Y.H. Reddy- Cost and Management Accounting-MargamPublications, Chennai
4. C.T.Horangren-Cost Accounting - A Managerial Emphasis- Pearson education-New Delhi

5. Jawaharlal - Cost Accounting-Tata Mc. Graw Hill

6. Ravi M Kishore Advanced Management Accounting - Taxman's-New Delhi.

SEMESTER-III
PAPER-10
INDIRECT TAXATION

UNIT I

Indian Federal system- An overview of federal finance – Canons of taxation – Direct and Indirect taxation – Merits and Demerits – Goods and Services Tax(GST) – Taxes and Duties subsumed under GST – Taxes and Duties subsumed under GST – Taxes and Duties outside the purview of GST Salient features of GST Act 2016.

UNIT II

Applicability of GST – Shortcomings at the Central Level – Advantage at the Central Level on introduction of GST – shortcomings at the state level - Advantage at the state level on introduction of GST – Apportionment of GST between Central and State – Input Tax Credit(ITC) under GST - Cross utilization of ITC between the Central GST and the State GST.

UNIT III

Collection of GST – Administration - Chargeability – Compounding Option – Returns under GST – Registration Number – Audit an Assessment – Other Features of Dual GST Model .

UNIT IV

GST- Rate Structure- GST rates in prominent Countries – zero Rating of Exports – GST on Imports – Special Industrial Area Scheme – Refund and Adjustment of GST - Transactions within a state Under GST and Inter-State Transactions Under GST

UNIT V

Customs Duties – Definitions - Goods- Imported Goods – Levy of Customs duty – Exemptions from customs duty - Baggage Rules – Authorities of Customs Duties. Powers – imposition of fines and penalties

Reference Books
1. Dinkar Pagare,Business Taxation,Sultan Chand &Sons ,New Delhi.
2. Balachandran V,Indirect Taxation, Sultan Chand & Sons, New Delhi .
3. Govindan M.S,Indirect Taxes Made Easy,Sitaraman & Co,Chennai.
4. Datey V.S, Indirect Taxes ,Taxman Publications, New Delhi.
5. GST Act 2016- Government of India.

PAPER-11

SECURTIY ANALYSIS AND PORTFOLIO MANAGEMENT

Unit-I

Investments: Nature, Scope, Avenues And Elements of Investment, Approaches to Investment Analysis; Tax and Transactions Cost in Investment, Financial Assets: Types, Characteristics and Alternatives; Sources of Financial Information.

Unit-II

Security Markets: Secondary and Primary, Public Issue: IPO and other types of issues in securities in India. Participants in the securities market; Stock-Market: - Stock-Exchanges, Trading and Settlement, Stock market quotations and Issues; SEBI and Future challenges in the settlement of securities market, SEBI guidelines in primary and secondary capital markets.

Unit-III

Intermediaries in the capital markets (including Depositories); Valuation of Debt and Equity instruments (with numericals); Valuation of Options and Futures.

Unit-IV

Fundamental analysis (Industry, Company and Macroeconomic analysis); Technical analysis (Charting techniques, Dow-theory, Moving average analysis, Moving average convergence divergence(MACD); Relative strength analysis, Technical indicators of Breadth, sentiments), Testing technical trading rules, Evaluation of Technical Analysis.

Unit-V

Portfolio performance evaluvation – Risk adjustment – Measures of Returns – Stratergies of the Great Masters.

Reference Books:-

1. Ranganatham, M. and Madhumati, R."Investment Analysis and Portfolio Management",

   Pearson education. Delhi-92.

2. Jordon, Fisher," Security Analysis and Portfolio Management", 6th Ed. Phi-New Delhi-110001.

3. Bodie, kane, Marcus and Mohanty, "Investments". TMH New-Delhi.

4. Chandra, P. "Investment Analysis and Portfolio Management". CFM-Mc Graw Hill

   professional series in finance. 4th Ed.

PAPER -12

INCOME TAX LAW AND PRACTICE

Unit I

  Basic Concepts and Definitions - Income Tax Act 1961-Definition of Income, Person, Assessee, Previous year, Assessment year, Gross total Income and Total Income – Capital Income and Expenditure – Revenue Income and Expenditure.

Unit II

  Exempted Incomes – Determination of Residential status – Scope of Total Income and Incidence of Tax.

Unit III

  Income under different Heads – Income from Salaries – Definition of Salary– Allowances – Perquisites – Profit –in-lieu of salary – Deductions U/s.16 – Computation of Income from salaries.

Unit IV

  Income from House Property –Exempted income from House Properties– Annual Value – Determination of Annual Value – Deduction U/s.24 – Computation of income from house property: Self occupied property – Let out property and Deemed to be let out property.

Unit V

  Profits and Gains of Business or Profession - Definition of Business or Profession – Deductions expressly allowed and disallowed while computing Income from Business or Profession – Depreciation and Other allowance – computation of income from Business– Computation of Income from profession.

Note: Theory 40% and Problems 60%
Reference Books:

1. Income Tax, Wealth Tax and Tax Planning – By Dr.H.C. Mehrotra – Sahitya Bhawan Publications, Agra.

2. Income Tax Law & Practice – By Gaur & Narang, Kalyani Publishers- Ludhiana.

3. Direct Taxes – Dr.Vinod, K.Shingania – Taxmann Publications- New Delhi.

4. Income Tax Law and Practice, Dr.A. Murthy, Vijay Nicole Imprints Private Ltd, Chennai.

5. Income Tax Law & Practice- Dr.N.Hariharan Vijay Nicole Imprints Private Ltd, Chennai.

ELECTIVE PAPER- 3

A. CUSTOMER RELATIONSHIP MANAGEMENT

UNIT I

Introduction to Customer Relationship Management – Emergence of Relationship Marketing – Distinction between Traditional Marketing and Relationship Marketing – Six Market Model – Three Cornerstones of CRM – CRM Survey Design – Advances of CRM – Types of Customer Relationship Programmes – Scope for CRM.

UNIT II

Customer Relationship – Categorizing Relationship – The Relationship Life Cycle – Customer Acquisition – Customer Retention – Relationship Stages – Relationship Longevity – Know Your Customer (KYC) – CRM Business Transformation Process – Integration of CRM with ERP – Data Warehousing .

UNIT III

The analyzing phase of Relationship Marketing - Target Planning – Customer Segmentation in Relationship Marketing – Customer Loyalty – Relationship Marketing – Customer Satisfaction Process – Customer Partnership.

UNIT IV

Implementing Relationship Marketing Programmes – Strategy, Structure and Systems – The McKinsey 7 'S' Framework – Ending Relationships – Total Quality Management (TQM) – Shared Values, Staff, Skills and Styles of Implementing RM programmes.

UNIT V

Monitoring and controlling relationships – Approaches – Measures of Relationship Success – Satisfaction – Relationship Returns measuring financial performance – Complaints analysis and handling – Service Recovery – Service quality – The GAPS Model for managing service quality – Technology for Relationship Marketing – Criteria for creating value for customers.

Reference Books:

1. Customer Relationship Management – Dr.S.Sheela Rani, Margham Publications, Chennai.

2. Customer Relationship Management: A Strategic Approach to Marketing , Kaushik Mukerjee, PHI Learning Pvt. Ltd.

3. Customer Relationship Management; A Databased Approach, V.Kumar, John Wiley & Sons.

ELECTIVE PAPER-3

B.SERVICES MARKETING

UNIT-1
Growth of the service sector – Nature and concept of service – classification of service – Characteristics of services and their marketing implications – Essential Elements of marketing mix in service marketing.

Unit -2
Marketing Strategies for service Firms with special refrence to information,communication,consultancy,advertising,Tourism,Esucational Institutions – Health Care Institutions.

Unit - 3

Product support Services – Pricing of Services – Problems of service quality management – Customer Expectations – innovation in services.

Unit- 4

Marketing of financial services – nature – types – marketing of insurance – mutual fund – marketing for non – profit firms – Growth of financial services in India.

Unit- 5
CRM – identifying and satisfying Consumer needs – Relationship marketing – Consumer Satisfaction – Managing Service Brands.

Reference books

1. Christopher lovelock, Services Marketing, Pearson Education.

2. E.G. - Bateson, Managing Service marketing - Text and Readings, Dryden press, Hidsdale

3. Philip Kotler and Paul N.Bloom, Marketing professional Services, Prentice hall, New Jersey.

4. Payne, the essence of Service Marketing, New Delhi, prentice Hall.

5. Helen Wood Ruffe, Services Marketing, Macmillan India, New Delhi.

    6. Mary Ann pezzallo, Marketing Financial Services, Macmillan.

PAPER – 13

ADVANCED COST ACCOUNTING – II

UNIT-I

Methods of Process costing – Types of industries using Process Costing – Costing Procedure – Process Losses - Treatment of Equivalent Production- Inter Process Profit- Joint and By Product Costing.

UNIT - II

Marginal Costing – Features of Marginal Costing – Absorption Costing – Cost Volume Profit Analysis – Break-even Analysis and BEP – Margin of Safety – Application of Marginal Costing - Differential Costing or Incremental Analysis.

UNIT - III

Managerial Decisions under Marginal Costing Technique – Key Factor – Make or Buy – Sales Mix – Plant Merger – Export Decisions – Product Elimination – Selling below Cost – Shut Down or Continue – Further Processing Decision.

UNIT-IV

Standard Costing and Variance analysis-Material, Labor and Overheads Variances.

UNIT-V

Activity based costing–Meaning and concept-Characteristics of ABC-Benefits from adoption of ABC-Just in Time Costing (JIT)

Note: Theory 20% and Problems 80%

Reference Books

1. S.P. Jain and K.L. Narang-Cost accounting-Kalyani Publishers-New Delhi.

2. B.K. Bhar- Cost Accounting-Academic publishers, Calcutta

3. T.S.Reddy and Y.H. Reddy- Cost and Management Accounting- Margham Publications, Chennai

4. C.T.Horangren-Cost Accounting - A Managerial Emphasis- Pearson education-New Delhi

5. Jawaharlal - Cost Accounting-Tata McGraw Hill

6. Ravi M Kishore Advanced Management Accounting - Taxman's-New Delhi.

7. Robert S. Kaplan-Anthony A. Atkinson- Advanced Management Accounting - Prentice Hall of India-New Delhi

PAPER - 14

RESEARCH METHODOLOGY

Unit I

Research – Definition – Characteristics - Nature and Scope – Types of Research – Major steps in Research – Formulation of a Research Problem – Review of Literature – Research Design – Hypothesis – Uses of Social Research.

Unit II

Data Collection – Sources of Data – Primary and Secondary Data – Procedure for Data Collection – Tools of Data Collection – Observation - Questionnaires - Schedule- Interview.

Unit III:

Sampling – Types of Sampling – Errors in Sampling - Processing of Data – Editing - Coding - Classification and Tabulation – Analysis of Data.

Unit IV

Statistical Analysis – Diagrammatic and Graphic Representation – Interpretation of results - Percentages - Bar Diagrams – Pie-charts – Introduction to SPSS - Factor Analysis – Cluster Analysis – Correlation – Regression - T-test – ANOVA – Chi-square test.

Unit V

Research Reports – Structure and Components of Reports – Types of Research Reports – Features of good Research Report.

Note: Problems 20% and Theory 80% (Problems only from Unit IV)

Text Books

1.   Beri, G.C. Business Statistics, New Delhi, TATA McGraw Hill, 2nd Edition.

2.   Kothari. C.R. Research Methodology, New Age International (p) Ltd, New Delhi, 2004.

3.   Krisnasamy. O.R, and M. Ranganathan. Methodology of research in social science, Himalaya Publishing house, Mumbai, 2005.

4.   Bhandarkar Wilkinson laldas. Methodology and techniques of social research, Himalaya Publishing house, Mumbai, 2004.

5.   Ravilochanan. P – Research Methodology – Margham Publications, Chennai, 2008

PAPER- 15

TOTAL QUALITY MANAGEMENT

Unit–I :

Basic concept of total quality (TQ), evolution of Total Quality management., cost of quality, Scope of TQM, Dimensions of Quality. Statistical Quality Control and Inspection –

Unit–II:
Concept of SQC – Acceptance sampling and inspection plans – Statistical Process Control – Prevention through process improvement. Process capability studies,

Unit–III :

Humanistic aspects of TQM, management of quality circle and Z.D. Programmers, Kaizen.

Unit–IV :

Q – 7 tools, Taguchi loss function, functional linkage of quality with reliability and maintainability, failure analysis, just – in – time system, JIT manufacturing system, JIT Pull system, use of kanban, JIT purchase.

Unit–V
Optimum maintenance decisions, TPM, Process design and the work process. Management support mechanisms, Customer Retention.ISO – 9000 standards,– Six sigma

Text Books:

1. Shridhara Bhat. K. Total quality Management, Himalaya Publishing House, Mumbai, 2004.

2. Pike, John and Barnes, Richard: TQM in action, London, Chapman & Hill, 1990.

3. Schmidt, Warren. H and Finnigan. Jerome P.: TQ Manager, San Francisco, Jossey Bass, 1993.

4. Spenley Paul.: World Class Performance through TQ, London, Chapman & Hall, 1992.

5. Suresh Dalela & Saurabh, ISO 9000 A Manual for Total Quality Management, New Delhi, S. Chand & Company Ltd., 2004.

6. Ansari A and Modarress B.: JIT Purchasing, New York, Free Press, 1990.

7. Gopal K. Kanji and Mike Asher: 100 methods for total quality management New Delhi, Sage Publication, 1996.

8. Grant, Ev. Gene L and Leavenworth, Richards,: Statistical Quality Control, New York McGraw Hill, 1991.

PAPER- 16

INCOME TAX AND TAX PLANNING

UNIT-I

Computation of Capital Gains: Meaning of Capital Gain – Capital Assets, Kinds of Capital Assets – Assets excluded from Capital Assets – Transfer of Capital Assets – Transactions not regarded as Transfer – Procedure for Computation of Capital Gains – Cost of Acquisition – Cost of Improvement - Exemptions from Capital Gains – Computation of Short term and Long tern Capital Gains.

UNIT – II

Income from other sources : Incomes chargeable to Tax under the head income from other sources – Specific Incomes - General Incomes – Deductions in Computing Income from other sources – Computation of income from other sources.

UNIT – III

Aggregation of income – Deemed incomes – Sett off of losses – Carry forward and Set off of Losses – Deduction allowed in computing Total Income.

UNIT – IV

Assessment procedures – types of Assesment – Income Tax Authoriies – Assessment to Individuals and Firms.

UNIT - V

Tax Planning – Tax evasion – Tax Avoidance – Tax planning in relation to Individual

HUF-Company – Tax Planning in relation to managaemant decision::Make or Buy;Own or Lease – Repair or Replace – Shut down or continue

REFERENCE BOOK:

1. Income Tax Law,Wealth Tax and -Tax planning- Dr,H.C. Mehothrs-Shitya Bhawan Publications,Agra.
2. Income Tax Law and Practice – BY Gaur &Narang Klayani Publishers – Ludhiana
3. Direct taxes – Dr.Vinod,K.Shingana – Taxmann Publications – New Delhi.
4. Income Tax Law and Practice – Dr.A.Murthy,Vijay Nicole Imprints private Ltd,Chennai.
5. Income Tax Law and Practice – Dr.Hariharan,Vijay Nicole Imprints private Ltd,Chennai

ELECTIVE

PAPER - 4

A. LOGISTICS AND SUPPLY CHAIN MANAGEMENT

OBJECTIVE

To understand the comprehensive nature of Logistics Management

UNIT I

Fundamentals of Logistics - Definition and Activities - Aims and importance - Progress in Logistics and Current trends - Organization and achieving integration.

UNIT II

Logistics Strategy - Implementing the Strategy - Locating Facilities - Planning Resources – Controlling Material Flow.

UNIT III

Procurement - Inventory Management - Warehousing and Material Handling – Transport – Global Logistics

UNIT IV

Basic Concepts of Supply Chain Management - Planning and Sourcing - Making and Delivering – Returns - IT and Supply Chain Management

UNIT V

Financial Supply Chain - Elements of Financial Supply Chain Management - The Evolution of e- Financial Supply Chain - E-Financial Supply Chain' (Banks Perspective) - Legal Aspects of e Financial Supply Chain

Reference Books

1. Waters Donald, Logistics: Introduction to Supply Chain Management, Palgrve Macmillan.
2. Christopher Martin, Logistic and Supply Chain Management: Creating Value- Adding Networks, PT Prentice Hall.
3. Dalmia Sanjay, Financial Supply Chain Management, McGraw Hill Publishing Co Pvt.Ltd.

Muthurangam Government Arts College (Autonomous)- Vellore-2   **M.Phil. (CBCS): Syllabus w.e.f.2017-18**

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Muthurangam Government Arts College, (Autonomous), Vellore - 632002

M.Phil in Commerce (FT / PT)

PART I SYLLABUS [with effect from Academic Year 2017-2018]

PAPER - I RESEARCH METHODOLOGY

UNTT - I

Nature and Scope of Research in Business- Types of Research - Significance - Research Process-Characteristics of Good Research.

UNIT - II

Problem Identification and Selection – Review of Literature - Research Design - Meaning, Need, Features of good Design - Different types of research design - Developing a research plan – Framing and Testing of Hypothesis.

UNIT - III

Sampling Design, Procedures, Types and Errors - Scaling Techniques, Rating scales – Attitude Scales-Likert, Thurstone and Guttman scales.

UNIT - IV

Methods of Data Collection - Primary and Secondary data – Sources - Questionnaire, Interview, Observation, Mail and E-Mail Surveys - Pilot study and pre-testing – Internet Sources - Data base - Web sites available for data collection.

UNIT - V

Analysis and Interpretation - Report Writing - Layout of the report - Types of report - Steps in writing the report - Evaluation of report

NOTE: The question paper shall cover 100% theory.

REFERENCES:

1. C.R.Kothari - Research Methodology - Methods and Techniques - New age International Publishers

2. Therese L Backer - Doing Social Research, Mc Graw Hill

3. Wilkinson & Bhanderkar - Research Methodology in Social Sciences.

4. Rummel & Ballaine: Business Research Methods.

5. Dr. Amarchand - Research Methods.

PART I - PAPER - II STATISTICAL ANALYSIS FOR BUSINESS RESEARCH

UNIT - I

Business statistics - Meaning and Definition - Scope and functions – Advantages and limitations - Meaning of data, variables, random variable, population and Sampling Techniques - Measures of central tendency - Mean, Median - Measures of dispersion - Standard deviation and Co-efficient of Variation.

UNIT - II

Correlation Analysis - simple, rank, Partial and Multiple Correlation – Auto Correlation - Regression analysis - Simple Linear Regression, Use of dummy variables.

UNIT - III

Testing of Hypothesis - Z Test – t Test - Chi-square Test - F Test and ANOVA.

UNIT - IV (Theory only)

Multivariate Analysis; Principal Component Analysis factor analysis discriminate analysis - Cluster Analysis and Path analysis.

UNIT - V

Non parametric statistics in Data analysis - The Sign test - Runs test - Mann - Whitney - U Test - Kruskal - Wallys Test - Time Series analysis.

NOTE: The Question paper shall cover 40% Theory & 60% Problem.

REFERENCES:

1. Levin and Rubin - Statistics for Management

2. S.P.Gupta - Statistical Methods

3. Kendall - Multiv artate Analysis.

4. Sanchetti & Kapoor - Advanced Statistical Methods.

PART I - PAPER III – 1. MARKETING MANAGEMENT

UNIT - I

Modern concepts of Marketing – New horizons of Marketing – Marketing System – Marketing functions – Marketing Environment.

UNIT - II

Consumer Behaviour – Theories and Buying Motives - Marketing Segmentation –Consumerism – Consumer Rights – Consumer Protection Council - Functions.

UNIT - III

Marketing mix – Product mix – Branding & Packaging - Price Mix – Promotion Mix.

UNIT - IV

Place Mix – Physical Distribution- Channels of Distribution –Role of Physical Distribution in India – Supply Chain Management – Direct Marketing and Retail Marketing.

UNIT – V

Recent Trends in Marketing – Viral Marketing – Customer Relationship Marketing – Green Marketing – Online Marketing – Rural Marketing – Impact of Multi-nationals on retail marketing.

REFERENCES:

 1. Gandhi .J.C, "Marketing", Tata McGraw Hill, New Delhi.

2. William J Stanton, "Fundamentals of Marketing", Tata McGraw Hill, New Delhi.

3. Philip Kotler, "Marketing Management", Prentice Hall of India, New Delhi.

4. Memoria.C.B and Joshi .R.L, "Principles and Practices of Marketing in India".

 5. Gupta A.P, "Marketing of Agricultural Goods in India".

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PART I - PAPER III – 2. FINANCIAL MANAGEMENT

UNIT - I

Financial Management – Meaning – Objectives – Financial Decisions – Functions of financial Manager. Time value of money –Present Value, Future Value and Compound Techniques.

UNIT - II

Cost of Capital – Meaning and Importance – Cost of Debt, Preference Share, Equity Share and Retained Earnings – Weighted Average cost of capital. Capital Budgeting – Meaning – Significance – Methods of Ranking Investment proposals.

UNIT – III

Leverage – Meaning – Financial Leverage – Operating Leverage – EBIT and EPS Analysis. Capital Structure – Theories of Capital Structure - Determinants of Optimal Capital Structure.

UNIT - IV

Dividend Theories – Walter's Model, Gordon, Modigliani and Miller's Model – Forms of Dividends – Factors determining Dividend Policy – Stability of Dividend Policy.

UNIT - V

Working Capital Management – Meaning – Objectives – Working Capital Policies – Factors Affecting working Capital Requirements – Forecasting of Working Capital Requirements - Sources of working Capital. Cash Management – Inventory Management - Receivables Management.

NOTE: The Question Paper shall cover 40% Theory and 60% problem.

REFERENCES:

1. Prasanna Chandra, "Financial Management".

2. Pandey I.M, "Financial Management".

3. Van Horne, "Fundamentals of financial Management".

4. Gitman .J, "Principles of Managerial Finance".

5. Maheswari. S.N, "Management Accounting & Financial Management".

6. Khan & Jain, "Financial Management".

PART I –

PAPER III - 3. HUMAN RESOURCE MANAGEMENT

UNIT - I

Human Resource Management (HRM) – Meaning – Definition –Objectives – Importance – History of HRM – Nature and Scope of HRM – Functions of HRM – Changing role of HR Manager – Human Resource Development (HRD) – HRD Mechanisms/subsystems – HRD in Indian Industry.

UNIT - II

Job Analysis – Definition, Uses, Process, and Methods – Job Description and Job Specification - Human Resource Planning – Objectives & Importance of HRP - Process of HRP - Recruitment –Sources of Recruitment – Selection – Steps in the Selection Process – Selection Testing – Selection Interview – Placement and Induction – Transfer and Promotion.

UNIT - III

Training - Features – Training Vs Development – Need for Training – Types of Training - Organisation Development – Characteristics & Objectives of OD – OD Interventions – Performance & Potential Appraisal – Employees Morale- Measures to improve Morale- Job Satisfaction –Motivation – Theories – Leadership –Theories – Group Dynamics.

UNIT - IV

Career Planning – Career Stages – Succession Planning – Need and Objectives of Career Planning – Process – Career Development – Career Management – Wage and Salary Administration – Employee Welfare – Health and Safety – Employee Grievances and Discipline –Industrial Relations and Disputes - Collective Bargaining - Trade Unions and worker Participation in Management.

UNIT - V

Recent Trends in HRM – Stress Management - Human Resources Information System - Human Resources Accounting – HRM Research and Audit – e-HRM – Balance Score Card – Knowledge Management – Emotional Intelligence – Talent Management – Managing Human Resource in Virtual Organizations.

REFERENCES:

1. V.S.P. Rao, Human Resource Management, Excel Books.
2. C.B. Gupta, Human Resource Management, Sultan & Sons.
3. P.C. Tripathi, Human Resource Management – Sultan & Sons.
4. Dr.K.Sundar & Dr.J.Srinivasan, Human Resources Development, Margham Publication, Chennai.
5. J.Jayasankar, Human Resource Management, Margham Publications, Chennai.
6. N.S Gupta, "Organisation Theory and Behaviour", Himalayas Publishing House, New Delhi.
7. Biswajeet Pattanayak, Human Resource Management, PHI
8. K. Aswathappa, Human Resource Management: Text and Cases, Tata McGraw-Hill Education.
9. T.V. Rao, Human Resources Development; Experiences, Interventions, Strategies.
10. Deb, Human Resource Development: Theory and Practice.

PART I –

PAPER III - 4. BANKING AND FINANCIAL SERVICES

UNIT – I

Banking Business in India-Financial services rendered by organized sector-Class Banking v/s Mass Banking-Commercial Banking functions-Micro credit-Emphasis on Rural Development and Agricultural lending.

UNIT – II

Central bank- functions-Role of RBI in Banking Sector-Risk Management –Credit Risk, Market risk and Operational risk- Basel II- Requirements on Capital Adequacy and 3 pillars Approach-Asset Liability Management.

UNIT – III

Merchant Banking-Progress of Merchant Banking in India-Export Finance-Pre Shipment-post shipment Credit-RBI & Export Finance- Exim bank. Private Sector Banks v/s Public Sector Banks-Mergers and Acquisitions-Consolidation.

UNIT – IV

Priority Sector lending in Banks-Small Scale Industries & Tiny Sector-Functions of DICGC. Services of banks – Tele Banking Credit Card-ATM – Core Banking in India. Impact of Globalization on Banking Services.

UNIT – V

Project Evaluation – Technical Feasibility - Commercial Feasibility-Financial Feasibility Ratio Analysis-Break-Even Analysis- Working Capital Analysis-Risk Analysis- Profitability Analysis.

REFERENCES:

1. Radhaswami.M & Vasudevan.S.V "Banking" Schand & Co Ltd.

2. Saravanavel.P, "Modern Banking in India and Abroad", Margan Publications.

3. Suba Rao, Himalaya.P, "Principles and Practice of Bank Management" Publishing   House

4. Vasanth Desai "Development Banking Issues and Options"

5. "Journal of the Indian Institute of Bankers" Special Issues.

6. K.P.M Sundaram Sultan, "Money Banking, Foreign Exchange & International   Trade". S.Chand & Sons.

MUTHURANGAM GOVT. ARTS COLLEGE (A), VELLORE – 632002
BACHELOR OF BUSINESS ADMINISTRATION

CBCS PATTERN

(With effect from 2017-2018)

The course of study and the scheme of Examinations

S.No	Part	Study Components Course Title		Ins. Hrs & week	Credit	Title of the Paper	Maximum Marks		
							CIA	Exam	Total
SEMESTER I							CIA	Exam	Total
1	I	Language	Paper -1	6	3	Tamil	25	75	100
2	II	English	Paper -1	6	3	English	25	75	100
3	III	Core	Paper- 1	5	4	Principles of Management	25	75	100
4	III	Core	Paper- 2	6	4	Business Mathematics & Statistics - I	25	75	100
5	III	Allied	Paper -1	5	5	Business Communication	25	75	100
6	VI	EVS		2	2	Environmental Science	25	75	100
				30	**21**				
SEMESTER II							CIA	Exam	Total
7	I	Language	Paper -2	6	3	Tamil	25	75	100
8	II	English	Paper -2	6	3	English	25	75	100
9	III	Core	Paper -3	5	4	Organizational Behavior	25	75	100
10	III	Core	Paper -4	6	4	Business Mathematics & Statistics -II	25	75	100
11	III	Allied	Paper -2	5	5	Business Environment	25	75	100
12	IV	VE		2	2	Value Education	25	75	100
				30	**21**				
SEMESTER III							CIA	Exam	Total
14	III	Core	Paper -5	5	4	Banking and Insurance Management	25	75	100
15	III	Core	Paper -6	5	4	Financial Accounting	25	75	100
16	III	Core	Paper -7	5	4	Operation Research	25	75	100

17	III	Core	Paper -8	5	4	Human Resource Management	25	75	100
18	III	Allied	Paper -3	5	5	Managerial Economics	25	75	100
19	IV	SBE	Paper -1	3	3	Life Style Management	25	75	100
20	IV	NME	Paper -1	2	2	Management Concept	25	75	100
				30	**26**				

			SEMESTER IV				**CIA**	**Exam**	**Total**
21	III	Core	Paper-9	5	4	Production Management	25	75	100
22	III	Core	Paper-10	4	3	Marketing Management	25	75	100
23	III	Core	Paper-11	6	4	Cost Accounting	25	75	100
24	III	Core	Paper-12	5	4	Legal Aspects of Business	25	75	100
25	III	Allied	Paper -4	5	5	Entrepreneurial Development	25	75	100
26	IV	SBE	Paper -2	3	3	Computer Application in Business-I	25	75	100
27	IV	NME	Paper -2	2	2	Communication for Professionals	25	75	100
				30	**25**				

			SEMESTER V				**CIA**	**Exam**	**Total**
28	I	Core	Paper – 13	6	4	Management Information System	25	75	100
29	II	Core	Paper – 14	6	4	Research methodology	25	75	100
30	III	Core	Paper – 15	5	4	Materials Management	25	75	100
31	III	Core	Paper – 16	6	4	Management Accounting	25	75	100
32	III	Elective	Paper -1	4	4	Training & Development	25	75	100
33	IV	SBE	Paper-3	3	3	Computer Application in Business-II	25	75	100
				30	**23**				

			SEMESTER VI				**CIA**	**Exam**	**Total**
34	III	Core	Paper - 17	6	4	Project Work	25	75	100
35	III	Core	Paper - 18	6	4	Industrial and Labour Relations	25	75	100
36	III	Core	Paper - 19	6	4	Total Quality Management	25	75	100
37	III	Elective	Paper - 2	5	4	Financial Services	25	75	100

Part	Subject	Papers	Credit	Total Credit	Marks	Total marks
Part - I	Tamil	2	3	6	100	200

38	III	Elective	Paper - 3	4	4	customer relationship management and service marketing	25	75	100
39	IV	SBE	Paper - 4	3	3	Advertising and Salesmanship	25	75	100
40	V				1	Extension Activity			50
				30	**24**				

Part - II	English	2	3	6	100	200
Part - III	Allied (Odd Sem)	2	5	10	100	200
	Ailed (Even Sem)	2	5	10	100	200
	Elective	3	4	12	100	300
	Core					
	Paper	19	3-4	75	100	1900
Part - IV	Environmental Science	1	2	2	100	100
	Value Education	1	2	2	100	100
	Non – Major	2	2	4	100	200
	Skill Based	4	3	12	100	400
Part - V	Extension	1	1	1	50	50
	Total	**39**		**140**		**3850**

SEMESTER-I

Core-I

17U1BA1   PRINCIPLES OF MANAGEMENT

Unit-I: **Introduction**

Introduction – Definition – Nature –Scope of management –Management Vs Administration- Functions of management – Levels of Management – Skills of a manager – Roles of a manager -Contribution of F.W. Taylor, Peter Drucker, Henry Fayol.

Unit- II : **Planning**

Planning – Characteristics – Objectives – Importance – Advantages –Principles of planning – Types of planning - Process – Method and Types of plan - Decision making – Types of decision – Process - Techniques – Barriers to decision making and steps to overcome.

Unit- III: **Organizing**

Organizing – Meaning – Process – Formal and Informal Organization – Departmentation – Span of Management – Authority – Sources of Authority – Types of Authority – Delegation and Decentralization – Types of Organization Structure – Groups in Organization – Organizational Charts and Manuals.

Unit- – IV: **Staffing**

Staffing – Meaning – Nature – Importance – Recruitment – Selection – Training – Directing – Nature – Meaning – Significance – Supervision.

Unit-V: **Co-ordination and Control**

Co-ordination and Control – Principles of co-ordination – distinction between co-ordination and co-operation – Need and importance – types and techniques – distinction between co-ordination and control – Nature and Purpose of control – process – control techniques.

Learning Outcome:

It develops knowledge about the various functions of management.

Text book:

1. L.M Prasad – Principles of Management – Sultan Chand & Sons. 7th Edition 2007
2. C.B Gupta – Business Management – Sulthan Chand & Sons. 9th Edition 2012.

Book for Reference:

1. Stephens R. Robbins and David A Decenzo – Fundamentals of Management – 3rd Edition, Pearson Education, 2001
2. V.S.P. Rao, V. HariKrishna – Management – Texts and Cases, Excel Books, 2002

Core II

17U1BA2   BUSINESS MATHEMATICS AND STATISTICS- I

Unit – I **Introduction to Statistics:**

Meaning and Definition of statistics – Scope and Limitations – Presentation of data – Diagrammatic and Graphical Representation of Data.

Unit –II**: Measures of Central tendency:**

Mean – Median – Mode – Geometric mean and Harmonic Mean – Limitations.

Unit – III: **Measures of dispersion:**

Measures of dispersion –Range – Mean Deviation – Quartile deviation – Standard deviation – Co-efficient of variation – Lorenz curve – Measures of skewness.

Unit – IV**: Integration**

Integration – Basic concept and their application in business.

Unit –V**: Calculus**

Basic Calculus –Rules for Differentiation – Maxima and Minima and their application to finance.

Note 30% Theory, 70% Problem.

Learning outcomes:

1. Students who successfully complete this paper should be able toSelect appropriate statistical techniques for summarizing and displaying business data.Analyze and draw inferences from business data using appropriate statistical methods and computer software. Interpret and communicate the results of a statistical analysis in the context of a business problem.

Text Book:

1. J.K. Sharma – Business Statistics – Pearson Publications - Second Edition – 2014.

2. P. Navaneedham – Business Statistics and Mathematics- Jai Publisher Trichy, 2007.

Book for Reference:

1. R.S.N. Pillai and Bagavathi – Statistics – S. Chand and Sons – New Delhi -Second Edition, 1984.

2. P.R.Vital – Business Statictics and Mathemetics – Margham Publications- Second Edition 2001

Allied – I

17U1ABA1 BUSINESS COMMUNICATION

Unit –I: **Introduction**

Meaning and Importance of Business Communication – Objectives of Communication-Methods of Communication –Types of communication – Communication Process – Barriers of communication-Principles of Effective communication.

Unit – II: **Nature of Letters**

Business Letters – Structure of a letter - Qualities of a good business letter – Business enquiries – Offer and Quotation – Order - Execution of orders–Acceptance of orders-Cancellation of Order.

Unit – III: **Types of Letters**

Sales letter – Circular letter –Letter of Complaints –Collection letter-Bank Correspondence.

Unit – IV: **Communication Media**

Agenda- Minutes- Role of Company secretary- Medias of Communication- Telephone, Fax, Mobile phone, Email-search engines and its applications in business.

Unit – V: **Report Writing**

Report Writing- Layout- Types- Essentials- Drafting of application and curriculum Vitae.

Learning Outcomes:

1 .Effective Interpersonal Communication, Developing and Delivering Effective presentation.

Text Books:

1. Rajendra pal Korkhalli – Essential of business Communication – Sulthan Chand and Sons, 13th Edition 2011.
2. N.S.Ragunathan and Santhanam – Business Communication – Margham – 3rd Edition – 2011

Books for reference:

1. R.S.N.Pillai and Bagavathi – Commercial Correspondence and Office Management – Sulthan Chand and Sons,2003.
2. N.Kumar and R.Mittal – Office Organization – Anmol Publication, 1st Edition, 2002.

Core – III

17U2BA3   ORGANIZATIONAL BEHAVIOUR

Unit – I : **Introduction**

   Definition – Nature of Organizational Behaviour - Role of Organizational Behaviour – Organizational Behaviour models.

Unit – II: **Individual Difference**

   Perception – Attitude – Concept and Determinants – Learning – Theories- types of reinforcement.

Unit-III: **Personality**

   Concept-determinants of personality-personality traits - Leadership - concept-The Behavioural Theory – Situational Theory.

Unit – IV: **Motivation**

   Concept – Definition – Types – Importance - Maslow's Need Hierarchy Theory – Herzberg Theory.

Unit – V: **Organisational Structure:**

   Introduction – Climate – Culture – Change – OD intervention – Conflict Management.

Learning Outcome:

   Students analyse the behavior of individuals and groups in organizations in terms of the key factors that influence OB.

Text Book:

   1. L.M. Prasad - Organizational Behaviour – Sulthan Chand and , 5th Edition – 2012.
   2. Stephen P. Robbins and Timothy A. Judge – Organization Behaviour – Prentice Hall India-9th Edtion – 2002.

Books for Reference:

   1. Gerald Greenberg and Robert A. Baron – Behaviour in Organizations – Pearson Education, Delhi, 8th Edition, 2005
   2. Udai Pareek – Understanding Organizational Behaviour – Oxford University Press-3rd Edition 2013.

Core IV

17U2BA4   BUSINESS MATHEMATICS AND STATISTICS –II

Unit –I: **Correlation and Regression**

Correlation – Scatter diagram – Karl Person Correlation – Concurrent deviation method – Rank correlation – Uses of correlation – Regression Lines – Regression Co-efficient –– Co-efficient – Uses of regression in Business Problems.

Unit – II: **Times Series**

Times series – Components of time series – Measurement of trend – Semi average method – Method of least Square – Measurement of seasonal Variation.

Unit – III: **Index Numbers**

Index Numbers – Weighted and Unweighted numbers – Cost of living Index number.

Unit – IV: **Matrix and Determinants**

Matrix Theory – Operation on Determinants – Inverse of Square Matrix (not more then 3 orders) Solving Simultaneous equation Method using matrix.

Unit –V: **Mathematic for Finance**

Mathematic for Finance – Simple and Compound Interest – Annuities.

Theory 30% Problem 70%

Learning outcome:

1. To equip the students with the basic understanding the statistics.
2. To Learn modern analytical tools and techniques for the purpose of Management decision making

Text books:

1. P.R. Vital – Business Statistics and Mathematics-Margham Publications – Second Edition 2001
2. P. Navaneedham – Business Statistics and Mathematics, Jai Publishers. Trichy,2007

Book for reference:

1. R.s.N. Pillai and Bagavathi – Statistics – S. Chand and Compny – New Deihl, 2nd Edition, 1984
2. J.K. Sharma – Business Statistics – Pearson publication –second edition -2014

Allied – II

17U2ABA2   BUSINESS ENVIRONMENT

Unit –I: Introduction of Business Environment

Definition of Business Environment – Objective of Business – Social responsibility – Brief Overview of Demographic, Economic, Geographical and Ecological, Social and Cultural, Political and Legal and Technical environment and their impact on business.

Unit –II: Political Environment

Political environment: Functions – Types – Cultural environment: Family – Evolution of society.

Unit –III: Economic System

Economic System and their Impact on Business –Business Cycle – Inflation – Deflation – Rostow's stage of economic growth – National Income – National Income Accounts – Computation of National Income – Factors determination National Income –Population – Urbanization- Five Year Planning.

Unit –IV: Financial Environment

Financial environment – Financial System – Importance and Role of Bank – Credit creation – Commercial Bank in India –Function – Structure – Growth – Reserve – Methods of Credit Control.

Unit –V: Trade Agreement

LPG-Trade Agreement –World Trade organisation (WTO)- Functions – Trade Related Aspects of Intellectual Property Rights (TRIPS) – Trade Related Investment Measure (TRIMS) – General Agreement on Tariffs and Trade (GATT)- Liberalization – Privatization and Globalization – Business Ethics in India.

Learning outcome: To take more responsibility for their own career

Text Books:

1. Sankaran S – Business Environment – Margham Publications-3rd Edition – 2013
2. Franics Cherunilam – Business Environment Text and Cases – 20th Edition -2011

Books for reference:

1. Jayaprakash Reddy – Business Environment – APH publishing Corporation,2004
2. Velasquez – Business Ethics – Prentice Hall Of India, 5th Edition 2004.

Core –V   17U3BA5   BANKING AND INSURANCE MANAGEMENT

Unit – I: **Introduction to Banking**

Definition of Banking – Classification of Banks – Reserve bank of India – Objectives – Functions.

Unit – II: **Commercial Banking**

Commercial Banking – Function – Types of accounts – Negotiable Instruments– Meaning – Types.

Unit – III: **Electronic Banking**

E-banking – Meaning – Service – Mobile Banking – Meaning – Service – Internet banking – Meaning – Services. Small Finance Bank- Private bank – Foreign Bank.

Unit – IV: **Introduction to Insurance**

Insurance – Meaning – Features – Types – Advantages – Double insurance – Reinsurance – Difference.

Unit – V: **Life insurance & General Insurance**

Life Insurance - Features – Types of Premium - Claim settlement in life insurance. General Insurance – Features – Claim settlement in general insurance, Health Insurance

Learning Outcome:

1 Students gain knowledge about regulatory framework of banks in India, service rendered by commercial bank, private bank, foreign bank, small finance bank, E-banking.

2 Knowledge about the need of life, general and health insurance and claim settlement procedure.

Reference Books:

1. Murthy . A. Elements of Insurance – Margham Publication – 2nd Edition
2. S.C. Sahu & S.C. Das – Insurance Management – Himalaya Publishing House- 2009 edition.

Text Books:

3. Sundaram & Varshney P.N. – Banking Theroy law and practice –Vijay Nichole Imprints Private Ltd -5th Edition 2013
4. Mishra. M.N - Modern Concepts of Insurance – S. Chand & Company Ltd.

Core –VI

17U3BA6   **FINANCIAL ACCOUNTING**

Unit – I: **Introduction**

Introduction to accounting concepts – Conventions- Objectives of accounting – Rules – Principles of double entry system – Journal – Ledger – Trial balance.

Unit – II: **Depreciation**

Methods of depreciation–Straight line method – Written down value methods. – Methods of appreciation.

Unit – III: **Final Accounts**

Final Accounts of companies – Trading – Profit & Loss account – Balance Sheet with simple adjustment.

Unit – IV: **Single Entry**

Accounting for incomplete records – Single Entry – Meaning – Single Entry (Vs) Double Entry.

Unit –V: **Company Accounts**

Company Accounts – Shares-Types – Issue – Forfeiture and Reissue – Debentures –Types-Issue of debenture only.

Note: 30% Theory, and Problems 70%

Learning Outcome:

Financial accounting helps in the interpretation of financial information.

Text Books:

1. Reddy and Murthy – Financial Accounting – Margham Publication -7ᵗʰ Edition 2011
2. R.L. Gupta and V.K. Gupta – Financial Accounting –Sultan & Chand sons-8ᵗʰ Edition 2010.

Books for Reference:

1. Jain S. P. and Na4range K.L. – Advanced Accounting – Kalyani Publishers, New Delhi
2. Nagarajan K.L.,Vinayagam N &Mani P,L- Principles of Accountancy – Eurasia Publishing House, New Delhi, (Edition-2000)

Core –VII   17U3BA7   OPERATIONS RESEARCH

Unit –I: **Introduction of Operation Research**

   Introduction – Mathematical Formulation – Operations research – Definitions – Nature and scope – Significance – Characteristics.

Unit- II: **Linear Programming Problem**

   Linear Programming: Graphical Method – Formulations – Regulars Simplex Method – Big M Method.

Unit – III: **Stimulation models**

   Transportation Model – Transportation Problem – Initial basis feasible Solution using North West Corner Rule, Least Cost Method, Vogel's Approximation Method - Assignment Problem – Minima assignment problem – Maximization Problem in assignment.

Unit –IV: **Game and Queuing Theory**

   Game Theory – meaning – Saddle Point – Game without Saddles point (Mixed Strategies) – Dominance Property – Queuing theory and Meaning – Single Channel System, Multiple Channel System.

Unit – V: **Network Analysis**

   Network Analysis: PERT computation- Basic steps in PERT – Difference Between CPM and PERT –calculation of critical path and Project Duration.

Theory 30% Problem 70%

Learning Outcome:

1. This course is to develop an understanding of basic Management science techniques.
2. This course gives the students to managerial decision making.

Text Books:

1. Vital P.R. – Introduction to Operations Research, - Margham Publisher 1st Edition -1999
2. R. Panner Selvem – Operations Research –PHI- 16th Edition 2010

Book for reference:

1. Premkumar Gupta and Hira D.S- Introduction to Operation Research -1st Edition, S.chand Company Ltd., 1998.
   S.D. Sharma – Operations Research -13th Edition 2003

Core –VIII

17U3BA8   HUMAN RESOURCE MANAGEMENT

Unit –I: Introduction to Human Resource Management:

Scope and Objective Human Resource Planning – Functions of HRM – Human Resource Information System – Qualities of HR Managers – Changing role of HR Managers – Difference Between HRM and Personnel Management and HRD

Unit – II: HR Planning:

HR Planning , Process – Policies – Procedures –– Recruitment –Selection- Induction and Orientation.

Unit – III: Training and Development

Meaning- Definitions- Importance and Objectives – Methods of training – Performance Appraisal – Methods and uses of performance Appraisal.

Unit – IV: Job analysis and descriptions:

Components of Job Analysis – Job Description – Job Specification – Job Enrichment – Job Enlargement – Job Rotation- Job Separation- Retention-Quality Work Life.

Unit –V: Compensation Management:

Wages and Salary Administration – Incentives – Reward System.

Learning Outcome:

The aim of Human Resource Management is to give students knowledge, understanding and key and skill that are required by today's HR professionals and enable the students to effectively contribute to the dynamic organizations.

Text Books:

1. Dr.J.Jayasankar –Human Resource Management-Margham Publications, second edition 2014

2. K. Sunder, J. Srinivasan – Essentials of Human Resource Management – Tata McGraw Hill - 1st Edition 2013.

Book for Reference:

1. P.L Rao – Human Resource Management – Excel Books, 6th Edition 2004

2. Aswathapa – Human Resource Management and personal Management, Tata McGraw Hill Publications -2nd Edition 2002.

Allied –III

17U3ABA3   MANAGERIAL ECONOMICS

Unit – I: **Introduction**

Definition – Characteristics –Scope - Uses – Importance-Role of managerial Economist.

Unit –II: **Demand Analysis**

Law of demand – Types of demand – Price demand – Income demand – Elasticity of Demand-Price of related goods and demand – Indifference Curve Analysis – Demand Forecasting.

Unit –III : **Supply Analysis**

Meaning of Supply – Supply schedule – Law of supply – Determinants of supply –Elasticity of supply – Break Even Analysis – Advantages –Limitations-Economies of scale.

Unit – IV: **Law of Returns:**

Law of Diminishing Returns – Law of Increasing Returns – Law of constant Returns-Pricing Methods – Price Discrimination.

Unit –V: **Capital Budgeting:**

Definition-need-steps involved in the investment decision making process- Forms of capital budgeting- Nature of capital budgeting.

Learning Outcome:

Students will be able to make optimal business decisions by integrating the concepts of economics and mathematics.

 Text Books:

1. Joel Dean- Managerial Economics - PHI-15TH Edition 2002.
2.   P.L. Mehta – Managerial Economics – Sultan Chand & Sons-15th Edition 2000.

Book for Reference:

1. D N Dwivedi – Managerial Economics – Vikas Publishing House,6th Edition, 2006
2. T. Aryamala – Business Economics – Vijay Nicole Pvt. Ltd Revised Edition 2017.

SBE – I

17U3BASB   LIFE STYLE MANAGENMENT

Unit – I: **Personality Development**

Personality Development – Meaning – Definition – Components of personality Determinants, Ways to build positive personality.

Unit – II: **Career Development**

Career – Career Planning – Career Development – Career Management

Unit – III: **Stress management**

Stress management – Definition – Sources – Type – Symptoms – Measures to overcome stress.

Unit – IV: **Time management**

Time management – Definition – Importance – Functions – Planner – Time monitor - making schedules.

Unit – V: **Inter Personal Relationship**

Building positive Attitude – Inter Personal Relationship.

Learning Outcome:

The students acquires the knowledge about managing their own life style.

Text Books:

1. Stress Management – Dr.R.G. Parmar & Dr.Vibha – Paradise Publishers, 1st Edition 2011.
2. Aswathapa – Human Resource Management and personal Management, Tata McGraw Hill Publications -2nd Edition 2002

Books for References:

1. You can win – Shiv khera
2. The 7 habit of highly effective people – Stephen Covey

NME- I

17U3BANM   MANAGEMENT CONCEPT

Unit-I: **Introduction to Management**

Introduction to Management – Meaning – Definition - Nature – Scope –Functions of Management.

Unit -II: **Planning**

Planning – Meaning – Nature of Planning – Importance of Planning – Steps to make effective Planning – Planning Process - Methods of Planning. Decision making – Methods of Decision making

Unit – III: **Organizing & Staffing**

Organizing and staffing – Meaning – Process of Organization – Importance of Organization – Organization structure – Formal and Informal Organization – Staffing – Recruitment and selection Procedure.

Unit – IV: **Directing**

Motivation – Importance – Methods of motivation. Direction – Meaning – definition – Importance – Principles of Direction – Responsibilities of Supervisor – Span of Supervision.

Unit – V: **Co-ordination and Control**

Co-ordination – Nature – Importance – Problems – Principles of Co-ordination – Controlling – Nature – Functions – Benefits – characteristics of good control system.

Learning Outcome:

Students get maximum knowledge about historical background and fundamentals of management. They understand the basic facts regarding planning, organising, staffing, directing, co-ordination and how it is useful to administer the organisation successfully.

Text Books:

1. L.M Prasad – Principal of Managaement – Sultan Chand and Sons, Seventh Edition 2007.
2. C.B Gupta – Busines Management – Sultan Chand & Sons- 9th Edition 2009.

Books for Reference:

1. Stephens R. Robbins and David A Decenzo – Fundamentals of Management – 3rd Edition, Pearson Education, 2001
2. V.S.P. Rao, V. HariKsirishna - Management – Texts and cases, Excel Books,2002

Core- IX   17U4BA9   PRODUCTION MANAGEMENT

Unit – I:Introduction to production Management

Definition – Functions – Design of Production System – Types of Production – Responsibilities of Production Manager.

Unit – II: Plant Location

Objectives – Factors Influencing plant location – Plant layout – Definition – Objectives - Factors – Types of Plant layout – Advantages and Disadvantages.

Unit – III: Production planning and control

Importance – Function of Production Planning and Control – Stages – Uses for computer in Production Planning and Control – Design and Implementation of Production Planning and Control system.

Unit – IV: Maintenance Management

Objectives – Types of Maintenance and their advantage and disadvantages – Elements of maintenance.

Unit – IV: Quality control

Definition – Principles – Control Chart – X charts – R charts – Work study and Method Study – definition – Objectives – Steps – Procedure for Method study.

Learning Outcome: Apply logical and critical thinking in resolving a range of management issues in production management.

Text Books:

1. P. Saravanel and S. Sumathi – Production and material management – Margham Publication – 3rd Edition 2011.
2. R. Panner Selvan – Production and operations Management-- PHI -2nd Edition 1999.

Books for Reference:

1. B.S. Goel – Production and Operations Management – Pragati Prakshan – 17th Edition – 2002
2. J.P. Saxena – Production and Operations Management – Tata McGraw Hill – 1st Edition 2010.

Core- X

17U4BA10   MARKETING MANAGEMENT

Unit – I: **Introduction**

Introduction – Meaning of Market – Classification of Market – Definition of Marketing – Features –Marketing Functions – Difference between Marketing and selling – Marketing Environment – Marketing Mix.

Unit – II: **Consumer Behaviour**

Consumer Behaviour – Buyer, consumer and Customer – Factors involved in buying decision – Steps involved in buying decision- Buying motive – Factors influencing buying Behaviour – Process of Buying – Market Segmentation – Targeting – Positioning .

Unit – III: **Product Policy**

Product – Product Policy – Product Mix - Product Life Cycle – New Product Development – Branding – Product Packaging and Labeling

Unit – IV: **Pricing and promotions**

Pricing and promotions – Pricing– Factors Influencing Pricing Decisions – Kinds of Pricing Steps in price determination -– Promotions – Objectives– Sales Promotion at various levels.

Unit – V: **Advertising**

Advertising – Meaning – Objectives – Kinds of advertisement- AIDA concept – Factors Determining Advertising – Advisements Copy – Channels of Distribution.

Learning Outcome:

Develop a strategically focused integrated marketing communications plan based on research and analysis of a brand, its competition, and consumer behavior using appropriate communication strategies.

Text Books:

1. Rajan Nair – Marketing management - Sultan Chand & Sons, 2nd Edition 2013.
2. R.S.N. Phillai and Bagavathi – Modern Management – sultan Chand & Sons 1st Edition 2013

Books for References:

1. Jayasankar – Marketing – Margham Publications – 2nd Edition 2012
2. Philip Kolter Armstrong – Principles of Marketing – Pearson Education,11th Edition 2003

Core- XI   **17U4BA11   COST ACCOUNTING**

Unit – I: **Cost Accounting**

Cost Accounting – Meaning – Objectives – Elements of Cost Accounting – Advantages and Disadvantages of Cost Accounting – Difference between Cost Accounting and Management Accounting – Preparation of Cost Sheet.

Unit – II: **Labour and Overhead**

Labour and Overhead cost: Meaning – Importance of Labour – Methods of remuneration System – Overhead – Meaning – Definition – Overhead distribution system

Unit – III: **Contract costing**

Contract costing – Meaning – Definition – Characteristics of contract costing – Distinction between job costing and contract costing - Problems in contract costing.

Unit – IV: **Process costing**

Process costing – Meaning – Definition – Characteristics – Advantages and Disadvantages- Important aspects of process costing – Distinction between process and job costing – Calculation of normal loss – Abnormal loss – Abnormal gain – Inter process profit.

Unit – V: **Marginal costing**

Marginal costing – Meaning – Objectives – Uses and Limitation of marginal costing – Break Even Analysis .

Note: 30% Theory, 70% Problem

Learning Outcome:

Cost accounting helps in learning different accounting methods to determine the cost of producing product and then how to use that information to make a profit.

Text Books:

1. T.S Reddy and Hari Prasad "Reddy – Cost Accounting – Margham Publications – 4th Edition 2011
2. Jain and Narang – Cost Accounting – Kalyani Publishers – 17th Edition 2002

Books for Reference:

1. M.Y. Khan and P.K Jain –Costing Accounting – Tata McGraw Hill – 2002
2. S.N. Maheswari – Principles of cost Accounting – Sultan Chand & Sons – 2nd Edition – 2001

Core- XII   17U4BA12   LEGAL ASPECTS OF BUSINESS

Unit – I: **Indian Contract Act 1872**

Law of contract – Elements and Types of contract – Formation of a contract, Free Consent- Offer and Acceptance- Breach of contract and its remedies.

Unit –II: **Sale of goods Act, 1930**

Definition of sale – Actual sale – Agreement to sell – Distinction between sale and agreement to sell – Conditions and Warranties – Doctrine of Caveat emptor – Delivery of goods – Transfer of property - Possession and risk – Transfer of title by non-owners – Right of buyer – Right of unpaid seller – Resale – Auction sale.

Unit – III: **Companies Act 1956**

Major principles – nature and types of companies – Formation- Memorandum and Articles of Association- Prospectus, Power- Duties and responsibilities of Directors- Winding up of companies.

Unit – IV: **Sales Tax Act 1956 and Information Technology Act 2000**

Definition – Scope - Incidence of CS- GST - Procedures for Consumer grievances -Redressal - Types of consumer redressal machineries and forums – Information Technology Act 2000.

Unit – V: **Income Tax Act 1961**

Basic concepts anf Definitions – Residential status and Incidence of Tax – Deduction from Gross Total Income – Rebate of Income – Heads of Income – Tax Deduction at Source(TDS)

Learning Outcome: Students would analyse legal problems, correctly applying the applicable law.

Text Books:

1. P. Saravanavel & S. sumathi – Legal System In Business, Himalaya Publishing House -2nd Edition 2014.
2. T. S. Ravi – Legal System in Business – Margham Publications -1st Edition 2012.
3. S.S.Sankaran – Business Environment - Margham Publications -3rd Edition 2004.

Book for Reference:

1. M C Kuchhal – Business Law – Vikas Publications, 4th Edition, 2005.
2. Akhileshwar pathak – Legal Aspects of Business – Tata McGraw Hill, 3rd Edition 2005.

Allied – IV

17U4ABA4   ENTREPRENEURIAL DEVELOPMENT

Unit –I: **Introduction to Entrepreneur**

Introduction - Meaning – Characteristics – Classification – Factors influencing entrepreneurship – Role of entrepreneurship in economic development.

Unit – II: **Entrepreneurial Development**

Rural Entrepreneurs – Definition –Problems – Women Entrepreneurs – Definition-Problems – Entrepreneurial growth – Entrepreneurial Development Programs – Needs – objectives- Institutional support to entrepreneurs.

Unit – III: **Business Idea and Generation**

Idea Generation Techniques – Identification of Business Opportunities – Marketing – Financial and Economic – Technical – Legal feasibility.

Unit- IV: **Project Report Layout**

Concept of Project appraisal – Methods of project Appraisal – Meaning- Significance- contents- Formulation of a Project report.

Unit –V: **Financial Institutions**

Franchising – Small exporters – Financial Institutions –IDBI, IFCI, ICICI, and SIDBI.- Micro, Small and Medium Enterprises(MSME)

Learning Outcomes:

Develop analytical and critical thinking skills necessary to make sound financial decision in business and personal areas

Text Books:

1. S.S. Khanka – Entrepreneurial Development – Sultan Chand & Sons, 1st Edition 2011.
2. Jayashree Suresh – Entrepreneurial Development – Margham Publications 1st Edition 2005.

Book for reference:

1. Supriya Singh – Entrepreneurship Development – Thakur Publication -1st Edition 2012.
2. C.B. Gupta & N.P. Srinivasan – entrepreneurial Development – Sultan Chand & Sons – Revised Edition 2010.

SBE –II

17U4BASB   BASIC COMPUTER APPLICATION IN BUSINESS –I

Unit –I: **Introduction to Microsoft Office 2007**

Introduction to Microsoft Office 2007 – Creating a Document in word – Saving – Formatting. Alignment – Fonts – Borders and Shading – Charts Hyperlinks – Inserting Clip Art – Mail Merge.

Unit – II: **Introduction to Microsoft Excel 2007**

Introduction to Microsoft Excel 2007 – understanding Spreadsheets – Working with Format menu – Tools menu.

Unit –III: **Data processing**

Data menu – Editing Data – formatting Text – Worksheet Creation Formulas – Functions in Excel.

Unit – IV: **Introduction to Microsoft Power Point 2007**

Introduction to Microsoft Power Point 2007 – Working with all Menus – Creating Presentation from Template – Changing colour

Unit –V: **Power Point Application**

Working with Charts – Reordering Slides – Duplicating Slides – Making Slides Shows Adding Audio – Adding Video Effect – Adding Animation – Adding Action Buttons.

Text Books:

1. Microsoft Office – Law Point Publishers, Kolkata, 1st Edition, 2004.

Book for reference:

1. Sanjay Saxena – First Course in Computer – Vikas Publication 2003 Edition.
2. D.Sandens - Computer in Business-M.C Graw Hill

Learning Outcome:

1. This course includes developing an appreciation of different software system available in industry among the student.
2. Build up the experience of computer usage in business organization with specific reference to commercial data processing system.

NME-II

17U4BANM   COMMUNICATION FOR PROFESSIONALS

Unit – I: **Introduction**

   Communication – Meaning – Process – Significance –Objective –Types – Media -Barriers to Communication.

Unit – II: **Letter writing**

   Business Letter – Need – Function – Kinds of Business Letter – Layout of Business letter – Enquiry – Reply.

Unit – III: **Letter writing**

   Offer and Quotations – Order – Execution and Cancellation. Claims and Adjustment – Collection letter – Sales promotion letter – Circular letter.

Unit – IV: **Report writing**

   Report writing – Structure of Reports – Drafting of application and curriculum vitae

Unit –V: **Modern communication**

   Modern Means of Electronic Communication – Internet – Email – Video – Conferencing – FAX.

Learning Outcomes:

   1 .Effective Interpersonal Communication, Developing and Delivering Effective presentation.

Text Books:

1. Rajendra Pal Korkhalli – Essential Of Business Communication – Sultan Chand and Sons, 13th Edition 2011.
2. N.S. Ragunathan and Santhanam – Business Communication – Margham -3rd Edition 2011.

Book for reference:

1. Sundar and A. Kumara Raj – Business Communication – Tata McGraw Hill, 1st Edition 2012.
2. N.Kumar and R.Mittal – Office Organization – Anmol Publication, 1st Edition, 2002

SEMESTER V

Core –XIII   17U5BA13   MANAGEMENT INFORMATION SYSTEM

Unit – I: **Overview of Information System**

Foundation of Information System: A framework for Business users – Roles of Information System – System concepts – Organization as a System – Components of Information System – Information System Activity – Types of Information System.

Unit –II: **Types of Information System**

Information System for Operation and decision making: Marketing Information System – Manufacturing Information System – Human Resource Information System – Accounting Information System and Financial Information System.

Unit –III: **Information Processing**

Transaction Processing System - Functions of Transaction Processing System – Information Reporting System - Information for Strategic Advantages.

Unit – IV: **Decision Support System**

DSS models and software - decision making process – Structured, Semi Structure and Unstructured Problems.

Unit –V: **Artificial Intelligence**

Overview of Artificial Intelligence – Neutral Networks- Functions of neural networks – Fuzzy Logic System – Expert System- Advantages and Disadvantages.

Learning Outcome: Analyze existing system and design technology solution appropriate to the goal of an organization.

Text Books:

1. Mohamed Azam - Management Information System – Tata McGraw Hill –1 st Edition 2012.
2. James A O'Breing - Management Information System – Tata McGraw Hill - 9th Edition 2010.

Book for Reference:

1. Gordon B. Davis Management Information System Conceptual Foundations. Structure and Development, McGraw Hill – 2 nd Edition 1974.
2. Turban Mc Lean and Wetherbe - Information technology for Management making connections for strategic advantages - 3 rd Edition John wiley1999.

Core –XIV

17U5BA14   RESEARCH METHODOLOGY

Unit- I: Introduction to research

Definition of research -Meaning of research meaning – Objectives of research – Types of research – Research process.

Unit- II: Research design and sampling

Definition-meaning of Research design – Types of Research Design – Sampling Techniques – Probabilistic and Non-Probabilistic.

Unit- III: Nature of data

Meaning – sources of Data - Primary data-Secondary data– Advantages and Disadvantages of data — Scales-Scaling Techniques.

Unit- IV: Analysis of data

Tabulation – Coding – Processing of data – Charts and Diagrams. (Theory Only)

Unit- V: Report

Report writing – Types of report- Oral and Writing

 Note: 100% Theory

Learning outcomes

Recognize the importance of variation and uncertainty in the world and understand how Statistics can improve decisions when faced with uncertainty, Obtain knowledge of and proficiency with a broad range of statistical concepts and tools useful for statistical applications, Develop critical thinking skills that enable application of Statistics in new and unusual settings

Text Books:

1. C.R. Kothari – Research Methodology and Techniques – Wishwa Prakasan – 2nd Edition 2003.
2. P. Raviloachan – Research Methodology – Margham Publication – 2nd Edition 2011.

Reference Books

   1. J.K. Sharma – Business Statistics – Pearson Publications - Second Edition – 2014.

   2. P.R. Vital – Business Statistics and Mathematics-Margham Publications – Second Edition 2001

Core –XV

17U5BA15   MATERIALS MANAGEMENT

Unit- I: **Materials Management**

Definition – Objectives – Importance – Classifications – Codification of Materials – Materials Forecasting and Planning - Integrated Materials Management.

Unit –II: **Purchase Management**

Objectives – Functions – Classification – Duties and Responsibilities of Purchase Manager – Buying decision.

Unit – III: **Storing Keeping**

Store Keeping and Store Material Accounting – Functions – Responsibilities – Benefits – Materials Handling – Bin Cards – Stores ledger – Stock identification.

Unit – IV: **Inventory control**

Functions of Inventory – Importance – Replacement Stock – Material Demand Forecasting –Basis Tools of inventory Control – EOQ – JIT –ABC analysis[Theory Only].

Unit – V: **ISO 9000**

The ISO 9000 series - Process of Obtaining ISO Certification – Aadvantages of ISO certification.

Learning Outcome:

Students understand the meaning of materials management and are able to manage and plan material flows.

Text Books:

1. P. Saravanvel and S, Sumathi - Production and Material Management – Margham Publications -3rd Edition 2011.
2. R. Panner Selvam – Production and Operations Management –PHI- 2th Edition 1999.

Book for Reference

1. P. Gopala Krishnan – Handbook of Materials Management –PHI 5th Edition 2002.
2. Arnold J. Chapman – Introduction to Materials management – Pearson Publications.

Core- XVI   17U5BA16   MANAGEMENT ACCOUNTING

Unit –I: **Management Accounting**

Management Accounting – Definition – Nature – Scope – Objective – Merits and Demerits of Management Accounting – Financial Statement analysis.

Unit – II: **Ratio analysis**

Ratio analysis – Uses- Limitations of ratios – Profitability – Liquidity Activity and solvency ratios.

Unit – III: **Fund Flow and Cash Flow Analysis**

Fund Flow Statement – meaning-problems in Fund Flow Statement - Cash Flow Statement-meaning-problems in Cash Flow Statement.

Unit – IV: **Budgeting and Budgetary control**

Budgeting and Budgetary control – Meaning – Objectives of Budgetary control – Advantages and Limitation of Budgetary Control –Zero Base Budget - Problems in Budgets.

Unit – V: **Capital Budgeting**

Capital Budgeting – Definition - Meaning – Future- Objectives of Capital Budgeting – Importance and Factors influencing capital budget – Methods of capital budgeting (Simple Problems)

Note: 70%Problerm, 30% Theory

 Learning Outcome:

Management accounting helps in learning various accounting techniques which supports business to plan, control, and monitor to enhance financial performance.

Text Book:

1. T. S. Reddy and Hari Prasad Reddy –Management Accounting – Margham Publications - 4th Edition 2011.
2. R.S.N. Pillai & Bagavathi – Management Accounting – Sulthan Chand & Sons 2nd Edition2002.

Books for Reference:

1. R.K. Sharma & K. Gupta – Management Accounting – Kalyani Publishers 3rd Edition 2002.
2. T. S. Reddy and Hansen T.S. Reddy –Management Accounting – Margham Publications - 4th Edition 2011.

Elective – I   17U5BAE1   TRAINING AND DEVELOPMENT

Unit –I: **Introduction**

Concept of Training and Development –Training needs –structure and function of Training Development –Evaluation of Training Programme.

Unit –II: **Techniques of Training and Development**

Techniques of on the job training – On the job Training – Coaching –Job Rotation –Job instruction training - Training by supervision –Techniques of off the job Training- Lecturer, Conferences, Group discussion.

Unit –III: **Career Stage**

Concept of career- Career Stage –Career planning and Development –Needs steps in career planning – Methods.

Unit –IV: **Training Needs**

Needs for Training in India – Policy on Training – Training Institution in India – Management Association.

Unit –V: **Management Development**

Concept of Management Development –Importance of Management Development – Components of Management Development Programme – Management development institute.

Learning outcome:

1. Training and Development focus on both training employees developing their future goals.

Text books:

1. Training and Development – R.K.Sahu publisher-Excel books, June 2009
2. Training and Development – Dr.B.Janakiraman publisher,Dream tech press2007

Book for Reference:

1. Aggarwala D.R.-Manpower Planning, Selection, Training and Development
2. Fundamentals of Training and Development-Dinesh kumar,Mansoor Ali publisher-Vyinda publications 2011

SBE- II
17U5BASB   ADVANCED COMPUTER APPLICATION IN BUSINESS

Unit- I: Introduction to HTML

Introduction to HTML Makeup – Basic Structure of an HTML Document the <! DOC TYPE> element – the <html> element – the <body> element.

Unit –II: HTML document

Creating and saving an HTML document – Opening the html document in a web browser – Modifying the background of html web page.

Unit –III: Adding plain text

Adding plain text to an html webpage – Headings – Paragraph – horizontal rule –subscript and superscript.

Unit –IV: Aligning text

Aligning text – formatting the text specifying the font –grouping the text indenting quotations –scrolling marquee – commenting the text –lists.

Unit – V: Creating hyperlink

Creating hyperlink colors – linking different web pages – inserting an image on a web page – Displaying alternate text for an image – Adding a border and aligning an image – image as links.

Learning Outcomes:

Students will develop a basic understanding of technologies and protocols used on the internet, and how to effectively use internet tools technologies including current web-based applications-,e-mail, and social networking tools, developing searching strategies: and basic web pages.

Text Books:

1. Microsoft Office – Law Point Publishers, Kolkata, 1st Edition 2004.
2. HTML 4.0 IN SIMPLE STEPS –Kogent solution inc. – published by Dremtech press.

Book for Reference:

1. Remesh Bangia – Learning HTML – Khanna Book Publishing Ltd, 2nd Edition.
2. HTML Black Book Steven Holzner Dream Tech Press.

Core – XVII

17U6BA17   PROJECT WORK

Each student shall be required to prepare the report on the basis of investigation carried out by them in a business or industrial organization. A typical problem of current interest in the area of management should be taken for the study. The report should demonstrate the capability of the students for some creative potential and original approach to solve the practical problems in today's business or industry.

The report should include field studies, surveys, interpretation, planning, and design of improved integrated management system, present in a comprehensive manner with recommendation for solution based on scientifically worked out data and viva-voce will be conducted on the basis of the report.

Evaluation pattern

- Each student should carry the investigation separately.
- The mode of evaluating the students will consist of two parts. One on the basis of Internal and the other on the basis of External.
- Project will be for a period of 1 month which will be during the month of December in every academic year.
- Each student should find a reputed industry to carry out the investigation with the approval of the department.
- After completing the project, the student should get an attendance certificate from the company.

The following are the components for evaluation:

Internal:

Overall review   - 25

External: Viva-Voice

Project Submission   -50

Oral presentation   -10

Question& Answer   - 15

Core – XVIII

17U6BA18   INDUSTRIAL AND LABOUR RELATIONS

Unit – I: Concept of Industrial Relations

Industrial relations – Role – Importance – Trade Union –Role of Trade Union-Function-Industrial dispute and their Resolution.

Unit – II: Participative Management

Participative Management – Structure – Scope –Methods of participative Management – Works Committee – Joint Management Council's Prerequisite For Successful Participation – collective Bargaining– Role Of Government In Collective Bargaining.

Unit – III: Industrial Unrest

Industrial Unrest – Employee Dissatisfaction – Grievances –Procedure for grievance Redressal- Disciplinary Action – Domestic Enquiry – Strike – Lockout – Prevention of Strike & Lockout.

Unit – IV: Factories Acts

Factories Act 1948 – Health - Safety Of Employees-Welfare Measures.

Unit – V: Workmen's Compensation Act 1968

Workmen's Compensation Act1968 - International Labour Organization – Role & Functions.

Learning Outcomes:

To understand managing employee relations at work.

Text Books:

1. Srinivasan M.R- Industrial Relation & Labour Organization- Margham Publications-3rd Edition
2. Aswathapa – Human Resource Management and Personal Management, Tata McGraw Hill Publications- 2nd Edition

Books for Reference:

1. Arun Monappa-Industrial Relations – Tata McGraw Hill Publication-34th Edition 2008
2. Dr. V. Balu-Industrial and Labour Relations-Sri Vengesteshwara Publications.

Core – XIX   17U6BA18   TOTAL QUALITY MANAGEMENT

Unit – I: Concept of Quality

Definition of Quality – Dimensions of Quality – Quality planning – Quality costs – Analysis – Techniques of Quality costs – Basis concepts of total Quality Management – Principles of TQM – Quality council – Quality Statements – Barriers to TQM – Implementation.

Unit – II: Nature of Customer Satisfaction

Customer Satisfaction- Customer Perception of Quality - Customer Complaints – Service Quality – Customer Retention – Employee Involvement – Continuous Process Improvement – Juran Trilogy –PDSA cycle -5S – Kaizen.

Unit –III: Supplier Relationship

Supplier Partnership- Partnering – Sourcing Selection - Supplier Rating – Relationship Development – Process capability- Concept of six-sigma – New Seven   Management Tools.

Unit –IV: Benchmarking

Benchmarking – Reasons to Benchmark – Benchmarking Process – Quality Function Deployment (QFD) – House of Quality –Quality Function Deployment Process – Benefits – Total Productive Maintenance (TPM) – Concept – Improvement Needs – Failure Modes and Effects Analysis (FMEA) – Stages of Failure Modes and Effects Analysis.

Unit –V: Quality Systems

International Organization For Standardization(ISO) – Origin – Introduction – Need for ISO 9000 and Other System –ISO 9000: 2000 Quality System – Elements –Implementation of Quality System Documentation-QS14001.

Learning Outcomes: Develop an understanding on quality management philosophies and framework

Text Books:

1. P. Saravanavel & S.Bala Kumar – Total Quality Management – Margham Publication -1st Edition 2010.
2. V.Jayakukmar – Total Quality Management – Lakshmi Publication, 6th Edition 2013.

Books for Reference:

1. Total Quality Management by Suganthi L and Anand Samuel.
2. Narayana V, and Sreenivasan, N.S. – Quality   Management; Concepts and Tasks – New Age International, 1996

Elective –II

17U6BAE2   FINANCIAL SERVICES

Unit-I: **Introduction**

Introduction –Structure of the Indian Financial system – Recent development-Financial Service – Concept – Objectives – Importance – Types of Financial service.

Unit-II: **Mutual Fund**

Introduction – Mutual fund – Types –Advantages and Disadvantages – Asset Management Company (AMC)-Net Asset Value (NAV). Analysing the mutual fund

Unit- III: **Capital market**

Capital Market; Meaning – Function – Importance – Money Market – Definition –Money Market Instrument – Capital Market Vs Money Market.

Unit-IV: **Factoring**

Introduction – Mechanics of Factoring– Types –Advantages and Disadvantage – RBI guidelines for factoring - Factoring Vs Bills Discounting - Meaning of Bills Discounting..

Unit –V: **Venture Capital & Credit Rating**

Venture Capital; Concept – Features – Forms of Venture Capital Function –Advantages-Credit rating process Rating Agencies-CRISIL – Investment Information & Credit Rating Agency –Credit Analysis and Research Limited . Credit Cards.

Learning Outcome:

Students get in-depth idea about various financial services, mutual fund capital market, factoring operations. They come to know the need of venture capital, credit rating agencies in India.

Text Books:

1, Dr.s. Guruswamy – Financial Service and System –Tata McGraw Hill-3rdEdition2012

2, B.Santhanam –Financial Service –Margham Publication -1stEdition 2003

Reference Books:

1,Sandeep Goel –Financial Service –Service PHI- 2012 Edition .

2,Nalini Prava Tripathy –Financial Service- PHI -5th Edition 2011.

Elective-III

17U6BAE3   CUSTOMER RELATIONSHIP MANAGEMENT

Unit-I: **Introduction**

CRM – Introduction – Definition – Need for CRM – Customer Satisfaction – Customer Loyalty – Product Marketing – Direct Marketing.

Unit-II: **Stages of Customer Relationship Management**

Customer Learning Relationship – Stages of CRM – Benefits of CRM - Growth of CRM marketing in India – Key Principles of CRM.

Unit-III: **Uses of Customer Relationship Management**

CRM Program-Effective use of CRM - Information Requirement for an effective use of CRM-Components of CRM-Types of CRM.

Unit-IV: **Process of Customer Relationship Management**

CRM Process and Framework –Governance Process- Performance Evaluation Process.

Unit-V: **Technology Customer Relationship Management**

CRM Technology Tool – Implementation – Use of Technology in CRM – Selection of CRM – Package Reasons Failure of CRM.

Learning outcome:

1. Integrating the firms value chain to create enhanced customer value at every steps.

Text Books:

1. Dr.s. Sheela Rani – Customer Relation Management – Margham Publication -2nd Edition 2011.

2. K. Balasubramaniyan – Customer Relation Management – GIGO Publication 2005.

Book for Reference:

1. Customer relationship management- concept, strategy and tools- V. Kumar, Reinrtz, Werner, Spinger.

SBE –IV

17U6BASB   ADVERTISING AND SALESMANSHIP

Unit –I: **Introduction to Advertisement**

Concept and Definition of Advertisement – Advertisement Objectives – Advertising Agencies – Advertising Effectiveness.- Different types of Advertisement Advertisement Campaigns . Advertisement goals , Advertisement budgets.

Unit- II: **Advertisement Media**

Media Plan – Types and Choice of Criteria –cost of Advertisement.

Unit – III: **Advertisement Copy**

Message Development – Layout –Design Appeal – Copy Structure – Advertisement Production

Unit – IV: **Personal Selling**

Personal Selling – Definition- Role and significance – Qualities of sales force – Personal Selling Process – Types of Personal Selling.

Unit –V: **Sales Management**

Sales Management – Recruitment and selection – Training – Supervision – Compensation – Motivation and Control. Sales quota, Sales territory.

Learning Outcome:

Students get more knowledge about the types of advertisement, advertisement copy, and media. They also understand the purpose of personal selling, sales force management.

Text Books:

1. Saroj & Varma – Advertisement & Salesmanship –Takur Publication -1st Edition 2012
2. Agarwal, P.K- Advertising Management – Pargati Prakashan -2nd Edition 2001

Book for Reference:

1. M.N. Mishra – Sales Promotion and Advertisement Management – Himalaya Publishing House 2nd Edition 2007.
2. P.Saravanavel and S.Sumathi- Advertisement Salesmanship- Margham Publications - 1st Edition 2010.

THIRUVALLUVAR UNIVERSITY
CHOICE BASED CREDIT SYSTEM (CBCS)
Master of Business Administration (M.B.A)
(Effective from the Academic year 2020-2021)
For Full - Time Course - (2 Years)
The Course of Study and the Scheme of Examinations

S No	Study components		ins. hrs/ week	credit	Title of the paper	Maximum marks		
	Course title					CIA	Uni. Exam	Total
				SEMESTER I				
1	Core	Paper 1	6	4	Management Principles	25	75	100
2	Core	Paper 2	6	4	Accounting for Managers	25	75	100
3	Core	Paper 3	6	4	Managerial Economics	25	75	100
4	Core	Paper 4	6	4	Research Methodology	25	75	100
	Internal elective for same major students (choose any one)							
5	core elective	Paper - 1	3	3	A. Business Communication B. Organizational Behavior C. Knowledge Management	25	75	100
	External elective for other major students (inter/multi disciplinary papers)							
6	open elective	Paper - 1	3	3	A. Communication Skills for Managers B. Compensation management C. Operation Research	25	75	100
			30	22				

SEMESTER II						CIA	Uni. Exam	Total
1	Core	Paper 5	6	4	Human Resource management	25	75	100
2	Core	Paper 6	6	4	Financial Management	25	75	100
3	Core	Paper 7	6	4	Marketing Management	25	75	100
	Internal elective for same major students (choose any one)							
4	Core Elective	Paper- 2	5	3	A. Operations Management B. Customer Relationship Management C. International Finance	25	75	100
	External elective for other major students (inter/multi disciplinary papers)							
5	Open Elective	Paper - 2	5	3	A. Industrial and Labour Relations	25	75	100

				B. Consumer Behaviour			
				C. Securities Analysis and Portfolio Management			
Field Study	-	2		100	-	100
Compulsory Paper	2	2	Human Rights	25	75	100
	30	22				

* Field Study

There will be field study which is compulsory in the first semester of all PG courses with 2 credits. This field study should be related to the subject concerned with social impact. Field and Topic should be registered by the students in the first semester of their study along with the name of a mentor before the end of the month of August. The report with problem identification and proposed solution should be written in not less than 25 pages in a standard format and it should be submitted at the end of second semester. The period for undergoing the field study is 30 hours beyond the instructional hours of the respective programme. Students shall consult their mentors within campus and experts outside the campus for selecting the field and topic of the field study. The following members may be nominated for confirming the topic and evaluating the field study report.

> (i). Head of the respective department
> (ii). Mentor
> (iii). One faculty from other department

SEMESTER I - (CORE 1)
PAPER – 1
MANAGEMENT PRINCIPLES

Objective:
- To develop an understanding of basic concept of management
- To enable the student manager to gain valuable insight into the working of business.
- To familiarize them with different components of organizational behavior.
- To Identify and explain the importance of the management process.
- To identify some of the key skills required for the contemporary management practice.

Course Outcomes:
The successful completion of this course shall enable the student to:

CO1: Understand basics of management theory, its functions and practice.

CO2: Understand the functions of management.

CO3: Understand individual, group and organizational components of organizational behavior.

CO4: Learn and develop skills related to staffing and directing.

CO5: Learn importance of co- ordination.

UNIT-I
Nature and Functions of Management - Importance and Process of Management - Historical Roots of Contemporary Management Practices: Pre-modern era-Classical Contributions - Development of Management Thoughts - Managerial Roles: Role of a Manager - Levels of Management - Managerial Skills - Social Responsibilities of Business.

UNIT-II
Nature and Importance of Planning -Types of Plans - Steps in Planning-Making Planning Effective - Strategic Considerations in Planning - Management by Objectives - Decision Making: Rationality in Decision Making - Decision Making and MIS - Forecasting: Techniques of Forecasting.

UNIT-III
Need for Organization - Principles and Process of Organizing - Span of Management - Organization Structure - Variables affecting Structure - Departmentalization - Authority, Delegation and Decentralization - Committees.

UNIT-IV

Staffing and Directing: Staffing as a Function of Management - Requirement of Effective Direction - Functions of Direction - Principles of Direction - Supervisor and his Qualities - Supervisor's Role and Functions - Effective Supervision.

UNIT-V
Co-Ordination - Need for Co-Ordination - Principles and Techniques of Co-ordination - Control: Need for Control - Steps in Control Process - Control Techniques.

References
1. Koontz, Weihrich, Aryasri. Principles of Management, TATA McGraw Hill, New Delhi, 2004.
2. Samuel C. Certo, S. Trevis Certo, Modern management 10 Ed, PHI Learning, New Delhi, 2008.
3. James A. Stoner, Edward Freeman, Daniel Gilbert, Management, PHI Learning, New Delhi, 2007.
4. Williams/ Kulshrestha, Principles of Management, Cengage Learning, New Delhi, 2011.
5. J.S. Chandan, Management Concepts and Strategies, Vikas Publishing House Private Limited, Delhi.

TextBooks
1. P.C.Tripathi, P.N. Reddy, Principles of Management, Tata McGraw-Hill Publishing Company Limited, New Delhi.
2. Prasad LM, Principles and Practice of Management, Sultan Chand & Sons, New Delhi.
3. Subba Rao .P, Management & Organizational Behavior, Himalaya Publishing House, Mumbai, 2011.

PAPER – 2 ACCOUNTING FOR MANAGERS

Objective:

- To give an insight into the basics of Accounting Concepts and Principles
- To know the students know about the different financial accounting concepts and help them to analyze the financial statements of the business.
- To understand the basic accounts for management..
- To understand the importance's of cost accounting
- To encourage the acquisition of knowledge and skills relating to application of accounting concepts and techniques for business decisions

Course Outcomes:

The successful completion of this course shall enable the student:

- To understand the fundamental concepts and principles of financial accounting and apply in business activities.
- To analyze and compare the financial statements of an organization with the help of different ratios and how these ratios help users in decision making.
- To understand the concepts and objectives of cost accounting, various costing methods used in manufacturing and non-manufacturing concerns.
- To understand the relationship of costs and revenues to output with the use of marginal costing, break- even analysis, CVP analysis etc.
- To make various types of budgets at organizational level for cost control and efficiency.

UNIT-I

Introduction to Financial, Cost and Management Accounting - Basic Accounting Concepts and Conventions - Accounting Records and Systems - Journal - Ledger - Trial Balance - Construction of Profit & Loss Account and Balance Sheet

UNIT-II

Financial Statement Analysis: Tools of Financial Statement Analysis - Ratio Analysis – Classification of Ratios – Profitability Ratios - Turnover Ratios – Financial Ratios.

UNIT-III

Fund Flow and Cash Flow Statement Analysis: Uses of Funds flow statement – Preparation of Funds flow statement – Difference between funds flow analysis and cash flow analysis – Preparation of cash flow statement (As Per AS -3)

UNIT-IV

Cost Concepts - Elements of Costs – Function of Cost Accounting - Cost Sheet - Marginal Costing – Feature of Marginal Costing - Cost Volume Profit Analysis – Important terms and concepts in CVP analysis – Application of Marginal costing.

UNIT-V

Budget and Budgetary Control - Budget as a Planning and Control Tool - Nature and Objectives of Budgetary Control - Preparation of Different Budgets – Capital Budgeting – Methods of capital budgeting.

Note: Problems 60% and Theory 40%

References

1. N.P.Srinivasan, M. Sakthivel Murugan, Accounting for Management, S.Chand & Company Ltd., New Delhi.
2. Dr. S.N. Maheshwari, Principles of Management Accounting, S.Chand & Company Ltd., New Delhi.
3. Man Mohan & S.N.Goyal, Principles of Management Accounting, Sahityabhavan, Agra, India.
4. Nitin Balwani, Accounting and Finance for Manager, Excel Books, New Delhi.

Text Books

1. R. Narayanasamy, Financial Accounting-A Managerial Perspective, Prentice Hall India, Pvt., Ltd., New Delhi.
2. S.P.Jain & K.L.Narang, Cost Accounting, Kalyani Publishers, New Delhi.

3. S.N.Pillai, Bagavathi & S.Uma, Fundamentals of Advanced Accounting, S.Chand & Ltd., New Delhi. Company.

SEMESTER I - (CORE 3)

PAPER – 3 MANAGERIAL ECONOMICS

Objective:
- To acquaint the students with the economic concepts and principles
- To enable them to use them to address business problems in a globalized economic environment.
- To understand the Production Concepts and Analysis.

Course Outcomes:
The successful completion of this course shall enable the student to:
- Describe the nature and scope of managerial economics, demand analysis and firm & its organization.
- Learn the techniques of production function, cost analysis and forms of market.
- Apply the pricing techniques to determine the price of factors of production.
- Apply the knowledge of national income accounting, inflation and monetary and fiscal policies in real world situations.
- Describe the trade cycles in the open economy and exchange rate determination.

UNIT-I
Nature and Scope of Managerial Economics - Business Decisions and Economic Analysis - Economic Theory and Managerial Economics - Managerial Economist's Role and Responsibility - Risk and Uncertainty - Basic Techniques.

UNIT-II
Demand Concepts - Demand Determinants - Demand Distinctions - Demand Elasticity and Demand Estimates - Demand Forecasting – Supply Factor and Economies of Scale.

UNIT-III

Cost Concepts - Cost Function - Cost-Output Relationship - Managerial Uses of Cost Functions - Production Concepts and Analysis - Laws of Production.

UNIT-IV
Price Concepts and Determination - Pricing Policies and Methods - Break-even analysis - Pricing under Different Objectives - Profit Maximization and Free Pricing - Government Interventions and Pricing - Pricing in Practice - Economic Theory of the Firm.

UNIT-V
National Income – Concept – National Income Accounts – Computation of National Income – Foreign Investment – Types – FDI and FII.

References and TextBooks
1. R.L.Varshney & K.L Maheswari, Managerial Economics, Vikas publishing House Private Ltd., New Delhi.
2. Joel Dean, Managerial Economics, Prentice Hall of India Private Limited, New Delhi.
3. D.M. Mithani, Managerial Economics-Theory and applications, Himalaya Publishing House, New Delhi.

4. Atmanand, Managerial Economics, Excel Books, New Delhi.
5. D.N. Dwivedi, Managerial Economics, Vikas Publishing House Pvt., Ltd., New Delhi
6. Paul A Samuelson and William D Nordhans, Economics, Tata McGraw-Hill Publishing Company Ltd., New Delhi.

SEMESTER I - (CORE 4)

PAPER – 4 RESEARCH METHODOLOGY

COURSE OBJECTIVE
 • To comprehend the objectives of research and the steps involved in research process.
 • To use different data collection methods and sampling design techniques in their own research.
• To analyze the collected and processed data with the help of statistical tools
. • To generalize and interpret the data and prepare a research report.

COURSE OUTCOMES:
- To obtain knowledge on various kinds of research problems and various types of data collection.
- To obtain the knowledge on various kinds of scaling techniques.
- Exhibit good practices in conducting parametric and non-parametric test.
- To obtain the knowledge on ANOVA and regression analysis.
- Explain various steps involved in writing the Research report.

UNIT- I

INTRODUCTION: Definition of Research, Research Problems in Management, *Types of Research* – Exploratory Research, Conclusive Research, Modeling Research, Research Process, Types of Hypotheses, Types of error, Statistical experiment and its design.Types of data, *Primary data collection* – observation method, personal interview, telephonic interview, mail survey, questionnaire design, Sources of Secondary data, Frequency distribution, Cumulative frequency distribution, Charts.

UNIT-II

Types of Scale, *Scales for Stimuli* – Thurstone's Case-V Scale model, Osgood's Semantic differential scale, *Scaling Respondents*- Likert scale, Q-sort scale. Sampling Methods – probability sampling methods (Simple random sampling with and without replacement, Cluster sampling, stratified sampling), Non-probability sampling methods- convenience sampling, judgment sampling, quota sampling, snowball sampling. *Basic statistical measures*- mean, median, mode, standard deviation, co-efficient of variation.

UNIT-III

Point and Interval Estimates of Means and Proportions; *Testing of Hypothesis* – One sample and Two Samples Z & t tests for means and variances, *Chi-Square Test*- for testing independence of categorized data; goodness of fitness test, Time series analysis. *Non-parametric tests* – one sample sign test, Kolmogorov-Smirnov test, run test, two sample sign test, two sample median test, Mann-Whitney U test.

UNIT-IV

Multivariate analysis- Correlation coefficient for ungrouped data; grouped data, rank correlation, auto-correlation, Multiple regression. ANOVA – Completely Randomized Design, Randomized

Complete Block Design, Introduction to Discriminate Analysis, Cluster Analysis, Factor Analysis and Conjoint Analysis.

UNIT-V

Types of report- technical report, survey based report, Guidelines for reviewing draft, Report format – Typing instructions, oral presentation, Introduction to SPSS.

Note: Problems 40% and Theory 60%

TextBooks
1. Donald R. Cooper, Pamela S. Schindler, New Delhi, TATA McGraw Hill, 9th Edition.
2. Beri, G.C. Business Statistics, New Delhi, TATA McGraw Hill, 2nd Edition.
3. Kothari. C.R. Research Methodology, New Age International (p) Ltd, New Delhi, 2004.
4. Krisnasamy. O.R, and M. Ranganathan. Methodology of research in social science, Himalaya Publishing house, Mumbai, 2005.
5. Bhandarkar Wilkinson laldas. Methodology and techniques of social research, Himalaya Publishing house, Mumbai, 2004.

Reference Books
1. David M. Boje: Narrative Methods for Organizational and Communication Research, New Delhi, Sage Publication, 2001.
2. Dwiedi R.: Research Methods in Behavior Science, New Delhi, Macmillan India Ltd., 2001.
3. Levin & Rubin: Statistics for Management, New Delhi, Prentice Hall of India, 2002.
4. Panneerselvam, R., RESEARCH METHODOLOGY, PHI Learning Pvt. Ltd., New Delhi, 2004

INTERNAL ELECTIVE

PAPER-1

BUSINESS COMMUNICATION

Objectives:
- To study the communication skills
- To understand the proper tone of language required in writing and speaking.
- To familiarize the speech structures and developing the speech outline.
- To communicate and develop presentation skills
- To apply it in practical business situations, written exercises & e-mails and letters: Re-writing and re-framing of sentences are being delivered.

COURSE OUTCOMES:
At the end of the course, the students will be able to:
- Recall the basics of communication and its process, elements and importance
- Communicate in an effective manner and to shine as a better leader and guide the team with effective communication skills.
- Evaluate the effectiveness of revising and checking the messages.
- Use of appropriate technology for business presentations and digital communication and Write E-mails in a structured pattern
- Employ the art of report preparation and writing various types of letters.

UNIT-I

Communication: Meaning and Definitions - Objectives of Communication - Role of Communication - Process and Elements of Communication - Communication Networks - Types and Media of Communication - Barriers to Communication - Characteristics for Successful Communication - Information Technologies.

UNIT-II

Management and Communication: Need and Importance of Communication in Management - Corporate Communication - Communication Training for Managers - Communication Structure in an Organization.

UNIT-III

Business Letter: Need of a Business Letter - Function of Business Letter - Kinds of Business Letter - Essentials of effective Business Letter - Language and Layout - Planning the Letters - Enquiries and Replies - Sales Letter - Orders, Tender and Notice - Complaints - Letter of Appointment.

UNIT-IV

Correspondence: Bank Correspondence - Insurance Correspondence - Agency Correspondence - Import-Export Correspondence.

UNIT-V

Report Writing: Meaning and Importance of Reports - Purpose of a Report - Types of Business Reports - Characteristics of a Good Report - Preparing a Report - Report by Individual and Committees - Agenda and Minutes of Meeting.

References

1. Rajendra Pal & J.S. Korlahalli, Essentials of Business Communication, Sultan Chand & Sons, New Delhi.
2. Namita Gopal, Business Communication, Galgotia Publications Pvt., Ltd., New Delhi.
3. Lesicar & Flatley, Basic Business Communication, Tata McGraw-Hill, publishing Company Limited, New Delhi.
4. P.D.Chaturvedi & Mukesh Chathurvedi, Pearson Education.
5. R.C.Sharma & Krishna Mohan, Business Correspondence and Report Writing, Tata McGraw-Hill Publishing Company Limited, New Delhi.
6. Basic Business communication, Raymond V. Lesikar, Tata Mc Graw Hill, 2009.

TextBooks

1. R K Madhukar, Business Communication, Vikas Publishing, New Delhi.
2. C. S. Rayudu, Communication, Hima;aya publishing, Mumbai. 2007.
3. Sundar.K Business Communication. Vijay Nicole Imprints Private Limited, Chennai .

ORGANISATIONAL BEHAVIOUR

COURSE OBJECTIVE:
- To understand the Organizational concept and models of OB.
- To understand and learn the effective interpersonal, team building and leadership skills.
- To familiarized to adjust better in organizational settings (by developing an understanding of how and why others behave in a particular manner).
- To improve the organizational performance through the effective management of human resources.

COURSE OUTCOMES:
- Explain the OB Model and its contributing discipline.
- Apply motivational theories to resolve problems related to organizational Performa
- Evaluate the behavior of individual and groups in terms of the key factors that influence organizational behavior.
- Identify organizational factors affecting teams and culture in which the group function.
- Assess the potential factors like power, politics. Culture, climate and change on organizational behavior.

UNIT-I
Definition and Meaning of OB - Need and Importance of OB - Nature and Scope - OB Models - Historical Evolution of Organizational Behaviour - Hawthorne experiments and its implications - Individual Behaviour: Personality: Factors Influencing Personality - Theories of Personality.

UNIT-II
Perception: Factors Influencing Perception - Perception Process - Managing the Perception - Learning: Principles and Theories of Learning - Attitudes ,Values and Job satisfaction - Stress – Causes of stress – Stress reduction strategies.

UNIT-III
Nature and Types of Group - Group Development - Determinants of Groups Behaviour - Group Dynamics - Group Norms - Group Cohesiveness - Group Decision Making Techniques - Conflict: Causes - Types - Conflict Management – Counselling.

UNIT-IV
Motivation: Nature and Importance of Motivation - Theories of Motivation - Leadership: Importance - Leadership Styles and their Implications - Theories of Leadership - Power –sources of power

UNIT-V
Organizational Culture - Organization Development (OD) - Pre-requisites - Factors affecting OD - Effectiveness of OD Programming - Organization Change: Importance - Types - Resistance to Change - Managing Change.

References
1. Stephen P. Robbins, Timothy Judge, Seema Sanghvi, Organizational Behaviour, Pearson Education, New Delhi, 2010.
2. Debra L. Nelson, James Campbell Quick Khandelwal Preetam – Organizational Behaviour, Cengage Publishers (LTR Series) , New Delhi, 2011.
3. John. W Newstorm and Keith Davis, Organizational Behaviour - Human Behaviour at Work, Tata McGraw-Hill Publishing Company Ltd., New Delhi, 2010.
4. Ricky W. Griffin, Gregory Moorhead, Organizational Behaviour, Biztantra, Delhi, 2009.

TextBooks
1. K. Aswathappa, Organizational Behaviour Text, Cases and Games, Himalaya Publishing House, New Delhi, 2011
2. Kalliath, Brough, O'driscoll, Manimala, Organizational Behaviour Tata McGraw-Hill New Delhi 2010

SEMESTER I - (CORE ELECTIVE PAPER 1 (C))
KNOWLEDGE MANAGEMENT

Objective: To prepare the students to participate in the organizational knowledge management efforts and how the three aspects, strategy, technology, and HRM need to be aligned together to facilitate management of knowledge.

Course Outcomes: The successful completion of this course shall enable the student:

CO1: To explain the evolution of knowledge management and its relevance in competitive environment.
CO2: To manage the entire process of KM & knowledge creation.
CO3: To develop knowledge leadership capabilities.
CO4: To apply knowledge management systems and tools.
CO5: To leverage knowledge as strategic resource using enabling technologies.

Unit I- Introduction: Definition, need and objectives of knowledge management; Organizational benefits of KM; The drivers of knowledge management; Challenges of KM implementation; Knowledge hierarchy; Structural and process perspective of knowledge; Context and relevance of KM in competitive environment and knowledge economy.

Unit II- KM Process & Knowledge Creation: Knowledge identification; Knowledge capture; Knowledge acquisition; Knowledge creation; Knowledge codification; Knowledge linking and building; Knowledge transfer & dissemination; Knowledge storage; Knowledge sharing; Knowledge application; Nonaka‟s model of knowledge creation-SECI model, Ba model.

Unit III- Knowledge Management Soft Support System: Developing knowledge leadership capabilities; Recruiting and selecting knowledge leaders; Strategic knowledge leaders; Developing a knowledge culture; Knowledge culture enablers; Developing and maintaining knowledge motivators, and other managerial and social infrastructure; Knowledge community.

Unit IV- KM Systems and Tools: Knowledge management systems; Knowledge system design and architecture; Knowledge maps, implementation and challenges of KM system; ICT and groupware technology; Knowledge technology; Data warehouse and data mining; Search engines; Expert systems; Knowledge portal; Intelligent agents.

Unit V- Knowledge Strategies: Knowledge as strategic resource; Knowledge strategies and its evaluation; Benchmarking; Knowledge audit; Introduction of enabling technologies of KM- big data, cloud computing, AI, etc.; Sustainable knowledge management; Top management challenges and emerging perspective ahead.

Learning experiences from real life case studies.

Readings (Unit wise)

Davenport, T. H. & Prusak, L. (1998). Working knowledge: How organizations manage what they know. Harvard Business Press.

Debowski, S. (2006). Knowledge Management. John Wiley & Sons Australia Ltd.

Newell, S., Robertson, M., Scarbrough, H. & Swan, J. (2009). Managing knowledge work and innovation. Palgrave Macmillan.

Awad, Elias M. & Ghaziri, Hassan M. (2004). Knowledge Management. Pearson Education Inc., Prentice Hall.

Communication Skills for Managers

Course objectives:
1. To train on public speaking skills.
2. To understand importance of language required in writing and speaking.
3. To familiarize the speech structures and developing the speech outline.
4. To develop presentation skills
5. Exercises to face the audience without any anxiety

Course outcomes:
1. Becomes good at public speaking skills and presentation skills.
2. Become good at oral and written communication.
3. Become good at pronunciation.
4. Ability to communicate and develop presentation skills with confidence.
5. Discover the impact of changing communication methods on society

UNIT-1:
Definition, Nature and Scope of Communication Importance and Purpose of Communication- Process of Communication-Types of Communication

UNIT II:
Non verbal Communication-Personal Appearance- Gestures- Postures- Facial Expression-Eye Contacts-Body Language(Kinesics)- Time language-Silence- Tips for Improving Non-Verbal Communication-Communication Networks-Verbal Communication (Oral-Aural)

UNIT III:
Verbal Communication (Written)

UNIT IV:
Communication as A Skill For Career Building- Preparing for a Career- Presentation Skills-Business Communication-Telephone Skills

UNIT V:
Soft Skills for Leadership and Team Management- Qualities of a Good Leader Leadership Styles-Decision Making- Intrapersonal skills- Interpersonal skills- Problem solving- Critical thinking- Negotiation skills

Text Books:

1. Business Communication for managers – PayalMehra, Pearson publisher, second edition 2016.

2. Effective Business English and Correspondence. - PattanChetty and Ramesh, M.S.,

3. Business Communication – N.S.Raghunathan&B.Santhanam, Margham

4. Business Communication – Dr. K. Sundar, Vijay Nicole Publication.

Reference Books:

1. Commercial Correspondence – R.S.N.Pillai and Bagavathi.

SEMESTER I - (OPEN ELECTIVE PAPER 1 (B))
COMPENSATION MANAGEMENT

Objective: The course is designed to promote understanding of issues related to compensation management in corporate sector and public services and to impart skill in designing compensation management system, policies and strategies, apart from promoting understanding of legal issues in the administration of compensation, welfare and social security.

Course Outcomes: The successful completion of this course shall enable the student:

CO1: To acquaint with the basic legal framework envisaged under the statutes for compensation and welfare of employees in different modes.
CO2: To understand the principles involved and premise of the grant of bonus, wages, and minimum wages to workers.
CO3: To be well versed with working in the maintenance and compliance vertical of compensation structuring department.
CO4: To handle the organizations scenarios having large scale variation of minimum wages both within the country and internationally.
CO5: To have insights about the employment benefits for women envisaged under compensation laws of India.

UNIT I-

Compensation Management: Compensation management process, forms of pay, financial and non-financial compensation; Compensation strategies, assessing job values & relativities; Pay structures; Designing pay levels, mix and pay structures, construction of optimal pay structure; Paying for performance, skills and competence; International pay systems- comparing costs and systems; Expatriate pay; Concept and rationale of employee welfare.

UNIT II-

The Payment of Bonus Act, 1965: Objects, scope and application; Definitions; Calculation of amount payable as bonus; Eligibility and disqualifications for bonus; Minimum & maximum bonus; Set on & Set off of allocable surplus; Application of Act in establishment in public sector; Bonus linked with production or productivity.

UNIT III-

The Payment of Wages Act, 1936: Objects; Application; Responsibility for payment of wages; Fixation of wage periods; Time-limits; Deduction from wages; Remedies available to worker; Powers of authorities, penalty for offences.

UNIT IV-

The Minimum Wages Act, 1948: Objects; Application; Minimum fair and living wages; Determination of minimum wage; Taxation of minimum wage; Advisory board; Remedy to worker for non-payment of minimum wages.

UNIT V-

The Maternity Benefit Act, 1961: Definitions, employment of, or work by, women prohibited during certain periods, right to payment of maternity benefits, notice of claim of maternity benefit and payment thereof, leaves, dismissal in absence during pregnancy, forfeiture of maternity benefits.

Case laws in respect of recent trends and administration of the Acts are required to be done in all units.

Armstrong, M. & Murlis, H. (1988). Reward Management: A Handbook of Salary administration.

Belchor, David W. (1988). Compensation Administration. Prentice Hall, Englewood Cliffs. NT

Malik, P.L. (2017). Handbook of Labourer and Industrial Law. Eastern Book Company.

Milkovich, G., Newman, J. & Ratnam, C.S.V. (2009). Compensation. Tata Mc Graw Hill, Special Indian Edition

Sharma, J.P. (2018). An Easy Approach To Company And Compensation Laws. New Delhi: Ane Books Pvt Ltd

OPERATION RESEARCH

Course Objective:
- To impart the knowledge of various concepts of Operations Research.
- This course will also serve as a prerequisite for post graduate and specialized studies and research.

Course Outcome:

CO – 1: Define and formulate linear programming problems and appreciate their limitations and to understand concepts and terminology of Linear Programming from formulation of
mathematical models to their optimization using Simplex Method

CO – 2: To comprehend the concept of a Transportation Model and develop the initial solution for the same and the concept of a Assignment model and develop the optimum schedule and optimum cost.

CO – 3: Identify and select procedures for various sequencing problems

CO – 4: Elucidate the potential or proven relevance of game theory and its impact in many fields of human endeavour which involve conflict of interest between two or more participants.

CO – 5: Identify various inventory models Investigate network analysis on elements of scheduling by CPM and PERT techniques.

Unit I Introduction to Operation Research
Introduction: Definition- Scope of OR in Business - Linear Programming Problems Formulation – Graphical method of solution- Simplex Method.

Unit II Transportation and Assignment problems
Transportation: Initial basic feasible solution methods -Optimality test– MODI method.Assignment Problems – Hungarian method.

Unit III Sequencing problems
Job Sequence: Introduction- Johnsons rule for n jobs through two machines- n jobs through three machines- n jobs through m machines- 2 jobs with K machines.

Unit IV Game Theory
Game Theory: Introduction- Two person Zero sum game- pure and mixed strategy- Dominance Property- Graphical Method of 2 n and m 2 solving game.

Unit V Network Analysis Network Analysis: Introduction – Basic Terminologies – Critical Path Method-PERT- Float analysis.

Text Books:
1. N. D. Vohra, "Quantitative Management", Tata McGraw Hill, 2006.
2. P. K. Gupta, Man Mohan, KantiSwarup: "Operations Research", Sultan Chand, 2008.
3. V. K. Kapoor: "Operations Research", Sultan Chand & Sons, 2006
4. J. K. Sharma: Operations Research Theory & Applications, Macmillan India Limited, fifth edition.2013

Reference Books:
1. Hamdy Taha, Operations Research, 8th Edition, Pearson Education, 2009.
2. Sharma J.K, Operations Research, 3rd Edition, Macmillan Business Books, 2009.
3. Sundaresan V, Ganapathy K.S, Ganesan K, Resource Management Technique- Lakshmi Publications, 2003.
4. Kalavathy S, Operations Research, 2nd Edition, Vikas Publications, 2009.

HUMAN RESOURCE MANAGEMENT

COURSE OBJECTIVE:
• To develop the employment relations and knowledge to resolve the issues.
• To Designing the appreciate role of HR specialist for implementing HRM policies.
• To Managing the manpower to motivate and attract them to retain in the organization.
• To develop the responsibility of employer and legal system to manage the employment relations.

COURSE OUTCOMES:
- Explain the importance of HRM in the organization through their roles responsibilities, challenges etc.
- Assess the major HRM functions and processes of HRM planning.
- Explain how training helps to improve the employee performance.
- Analyze the emerging trends, opportunities and challenges in performance appraisal.
- Apply the Concept of job application and how it is practically applied in the organsation and application of concept of employer and legal system to manage the employment relations.

UNIT-I

Human Resource Management – Objectives and Importance – Functions and Scope of HRM – Qualities of HR Managers –Changing role of HR managers - HR functions and Global Environment.

UNIT-II
HR Planning and Recruitment: HR Planning Process - Job Analysis - Recruitment and selection – Sources of Recruitment – Meaning and Process of Selection – Selection tests and interviews.

UNIT-III
Training and Development: Importance and Objectives of Training – Assessment of training needs – Methods of Training – Executive Development – Methods and techniques of Executive Development – Performance Appraisal – Uses and Process – Traditional and Contemporary methods of Performance Appraisal System.

UNIT-IV
Wage and Salary Administration: Objectives and Principles – Essentials of a sound wage structure - Methods of wage payments – Incentive Plans – Types of Incentive Plans – Profit Sharing - Job evaluation - Fringe benefits and services - Employee Welfare.

UNIT-V
Industrial Relations: Concept, Objectives and approaches – Causes and measures for industrial relations - Factors influencing industrial relations - - Role of Trade unions - Collective Bargaining - Workers' participation in management.

References

1. Decenzo & Robbins, Personnel / Human Resource Management, 3rd ed., John Wiley & Sons (Pvt.) Ltd.
2. Biswajeet Patanayak, Human Resource Management, PHI, New Delhi
3. Luis R. Gomez, Mejia, Balkin and Cardy, Managing Human Resources PHI, New Delhi.
4. Rudrabasavaraj, Dynamics of Personnel Admn. Himalaya Publishing House, Mumbai
5. Venkat Ratnam C.S. & Srivatsava, B.K. Personnel/Human Resource Management, Tata McGraw Hill, New Delhi
6. Monappa Arun & Mirzas Saiyadin, Personnel Management, Tata McGraw Hill, New Delhi
7. Gary Dessler, Human Resource Management - (8th ed.,) Pearson Education, Delhi
8. P. Subba Rao, Essentials of Human Resource Management & Industrial Relations, Himalaya Publishers, Mumbai.
9. Ian Beardwell, Len Holden, Human Resource Management - A Contemporary perspective, Macmillan India Ltd.

Text Books

1. C.B. Mamoria, S.V. Gankar, Human resource management, Himalaya Publishing House, Mumbai, 2006.
2. Gary Dessler, Biju Varkey, Human Resource Management Pearson Education, Delhi, 2009.
3. Rao .P.L, Comprehensive human Resource management, Excel Books, new Delhi, 2006.
4. Subba rao, P., Personal and Human resource Management, Himalaya Publishing House, Mumbai, 2004.

FINANCIAL MANAGEMENT

COURSE OBJECTIVE:
- To familiarized with the various sources of finance which a business house can mobilize.
- To Develop the ability to measure the risk and return of the various portfolios
- To Implement investment decisions, the process and methods of evaluation of various investment proposals.
- To Develop the skills to analyze the impact of various financing alternatives on the wealth maximization/ valuation of the firm.
- To Develop the ability to manage the profit generating (current) assets and strike a balance between liquidity and profitability.

COURSE OUTCOMES:

CO – 1: Identify the theoretical and practical role of financial management in business corporations.

CO – 2: Evaluate different capital budgeting techniques & its application on investment decisions

CO – 3: Assess the importance of risk within the context of financial decision making

CO – 4: Analyze the different pattern of capital structure of the firm & its impact on the shareholders wealth.

CO – 5: Estimate cost of capital for long term source of finance

UNIT-I

Financial Management: Objectives and Functions – Scope of Financial Management - Role of Finance Manager – Risk-return trade off – Time value of money.

UNIT-II

Capital Budgeting: Features and Objectives – Need and Significance of Capital Budgeting - Capital budgeting process – Methods of capital expenditure appraisal: Payback period, Accounting rate of return, Net present value, Internal rate of return, Profitability Index – Risk Analysis in Capital Budgeting.

UNIT-III

Cost of Capital – Components of Cost of Capital – Importance of Cost of Capital - Factors affecting cost of capital – computation of cost of debt, cost of preference shares, cost of equity and weighted average cost of capital.

UNIT-IV

Capital Structure Planning – Optimum capital Structure – Factors determining capital structure – Theories of Capital Structure – NI Approach – NOI Approach - MM Approach – Dividend policy – Types of dividends – Factors determining Dividing Policy – Walter's Model – Gordon's Model – MM Hypothesis.

UNIT-V

Working Capital Management – Definition– Types of Working Capital – Significance of Working Capital – Sources of Working Capital – Factors affecting working capital requirements – Forecasting working capital requirements.

Note: Problems 60% and Theory 40%

Text Books

1. I. M. Pandey, Financial Management, Vikas Publishing, New Delhi, 2009

2. Khan M.Y. and Jain P.K.: Financial Management - Text and Problems, New Delhi, Tata McGraw Hill Publishing Co., 6th edi, 2012

3. Chandra Prasanna: Financial Management - Theory and Practice, New Delhi, Tata McGraw Hill Publishing Co., 4th ed., 1997

4. Sheeba kapil, Financial Management, Pearson Education, New delhi, 2009

5. Eugene F. Brigham, Joel F. Houston, Fundamentals of Finance Management, Cengage learning, New Delhi, 2011

6. Kuchhal S C: Financial Management, Allahabad, Chaitanya Publishing House, 1994.

Reference Books

1. John C. Hull; Options, Futures and other Derivative Securities: New Delhi, Prentice Hall of India Pvt. Ltd., 2nd ed., 1996.

2. Pamela P. Peterson: Financial Management and Analysis, New York, McGraw Hill, Inc., International ed., 1994.

3. Rao P.M: Financial Management: New Methods and Practices, New Delhi, Deep & Deep Publication (P) Ltd., 1999.

4. Van Horne. James C: Financial Management and Policy, New Delhi, Prentice Hall of India Pvt. Ltd., 10th ed., 1996.

MARKETING MANAGEMENT

Objectives:

- To develop understanding of marketing concepts, philosophies and historical background
  - To understand concepts related to STP, product attributes, and pricing strategies prevalent in domestic and international scenario.
  - To study various tools and techniques of promoting the products in ethical manner.
  - To understand emerging concepts of marketing in the emerging global markets.
  - To understand the core concepts right from deciding the segment till customer satisfaction.

 COURSE OUTCOMES

The successful completion of this course shall enable the student to:

- Understand importance and nature of marketing, evolution of major marketing philosophies, marketing management tasks and process, meaning and impact of marketing environment on marketing decision making, and nature buying process of household and institutional customers.
- Describe target market selection and positioning process.
- Know issues and process involved with product planning and price determination.
- Describe issues and process involved with promotion planning and distribution strategy.
- Identify and describe developments and contemporary issues in marketing.

UNIT-I
Marketing management - marketing management process - assessing market opportunities - selecting target consumers - marketing mix - market segmentation - targeting and positioning - E marketing.

UNIT-II
Buyer Behaviour - influencing factors on Consumer Behaviour - buying decision process - industrial buyer behaviour - theories of buyer behaviour.

UNIT-III
Product policies - consumer and industrial product decisions - branding - packaging and labeling - new product development and product life cycle strategies.

UNIT-IV
Pricing - pricing strategies and approaches - Distribution - direct and indirect channel - retailing and whole selling - channel decision.

UNIT-V
Promotion - advertising - designing copy - media selection - sales promotion strategies - Marketing research - marketing research process - sales forecasting techniques.

References

1. Rajan Saxena, Marketing Management, 2nd edition, New Delhi, Tata Mcgraw Hill Publishing Co Ltd. 2001.

2. V.S. Ramasamy and S.Namakumari, Marketing Management, Planning, Implementation & Control, New Delhi, Macmillan, 2002.

3 Iacobucci Dawn, Kapoor Avinash, Marketing Management, LTR series, Cengage Learning, New Delhi, 2011

4 Biplab S. Bose, Marketing Management, 3rd edition, Himalaya Publishing House, Mumbai, 2010

Text books

1. Kotler Philip, keller, Koshy, Jha. Marketing Management, Pearson Education, New delhi, 2007

2. JoelR Evans, Berman. Marketing Management, Cengage Learning, New Delhi, 2009

3. V.S. Ramasamy and S.Namakumari, Marketing Management, Planning, Implementation & Control, Macmillan, New Delhi, 2009

4. Varshney, Marketing Management, Sultan Chand, New Delhi, 2010

OPERATIONS MANAGEMENT

Course Objective: -
To understand the strategic role of operations management in creating and enhancing a firm's competitive advantages.
- To understand the concepts of layout, planning, maintenance, quality and inventory control, material and store management.

Course Outcomes
- . Reveal the ability to apply some mathematical forecasting techniques
- Summarise the Facility Location concepts and to Classify the Layouts.
- Describe the inventory implementation system.
- Study the work study features
- To understand basic Maintenance Planning and Control concepts.

UNIT-I
Systems Concept of Production, Types of Production System, Productivity, World Class Manufacturing. Forecasting: Demand Patterns, Measures of forecasting, Forecasting Models: Simple Moving Average Method, Weighted Moving Average, Simple(single) Exponential Smoothing, Linear Regression, Delphi Method.

UNIT-II
Facility Location: Factors influencing Plant Location, Break Even Analysis. Plant Layout & Materials Handling: Classification of Layout, Advantages and Limitations of Process Layout, Advantages and Limitations of Product Layout, Advantages and Limitations of Group Technology Layout. Layout Design Procedures: Introduction to CRAFT, ALDEP & CORELAP, Material Handling System, Unit Load Concept, Material Handling Principles, Classification of Materials Handling Equipments. Line Balancing: Concept of Mass Production system, Objective of Assembly Line Balancing, Rank Positional Weight Method. Inventory Control: Review of Basic Models of Inventory, Quantity Discount Model.

UNIT-III
Implementation of Inventory Systems, Introduction to P & Q system of Inventory Nature of Aggregate Planning Decisions, Aggregate Planning Strategies, Aggregate Planning Methods: Heuristic Method, Flow Shop Scheduling: Introduction, Johnson's Problem, Extension of Johnson's Rule.

UNIT-IV
Work Study: Method Study – Recording Techniques, Steps in Method Study, Principles of Motion Economy, Time Study.
Quality Control: Introduction, Need for Controlling Quality, Definition of a Quality System, Classification of Quality Control Techniques, Control Charts, Control Charts for Variable, Control Charts for Attributes, C-Chart, Acceptance Sampling: Operating Characteristic Curve (O.C. Curve), Single Sampling Plan.

UNIT-V
Maintenance Planning and Control: Maintenance Objectives, Types of Maintenance, Basic Reasons for Replacement(Need for Replacement), Group Replacement Vs Individual Replacement – Trade-off.
Reliability: Reliability Improvement, Reliability Calculations for systems in series and parallel, Just-in-Time Manufacturing: Introduction-Overview of JIT, Kanban Systems.

TextBooks

1.Panneerselvam. R, production and operations management, 3rd Edition, PHI Learning, Delhi, 2013.

2.S.N. Chary, production and operations management, (Tata McGraw Hill).

References

1.Joseph G. Monks: operations management - theory and problems, (McGraw Hill).

 2.Everett E. Adam & Ronald J. Ebert: production and operations management, (Prentice Hall, 1994).

3.William J. Stevenson: production/operations management, Richard Irwin.

4.Norman Gaither: production and operations management, (The Dryden Press).

5.Jack R. Meredith, the management of operation, (John Wiley & Sons).

6.Jay Heizer & Barry Render: operations management, Prentice Hall International, Inc. 2001, International Edition.

Customer Relationship Management

Courses objectives:
- To make students understand about the importance of customer information database
- To teach on the elements and process of CRM
- To impart knowledge on the strategic and operational CRM
- To acquireinformation about the concept and types of service quality
- To make students understand the current trends in CRM

Course outcomes:
- Candidates will be enriched with the knowledge on customer behaviour, customer perception and customer profile analysis
- Students would be knowing about the structure and models of CRM for business applications
- Able to understand the tools of CRM, role of CRM managers in implementation and customer retention plans
- Candidates could be equipped with knowledge on service quality gaps, dimensions and methods of measurement
- Gain information about data mining, data warehousing and changing corporate culture

UNIT
INTRODUCTION
Definitions - Concepts and Context of relationship Management – Evolution - Transactional Vs Relationship Approach – CRM as a strategic marketing tool – CRM significance to the stakeholders.

UNIT II
UNDERSTANDING CUSTOMERS
Customer information Database – Customer Profile Analysis - Customer perception, Expectations analysis – Customer behavior in relationship perspectives; individual and group customer's - Customer life time value – Selection of Profitable customer segments.

UNIT III
CRM STRUCTURES
Elements of CRM – CRM Process – Strategies for Customer acquisition – Retention and Prevention of defection – Models of CRM – CRM road map for business applications.

UNIT IV
CRM PLANNING AND IMPLEMENTATION
Strategic CRM planning process – Implementation issues – CRM Tools- Analytical CRM – Operational CRM – Call center management – Role of CRM Managers.

UNIT V
TRENDS IN CRM
e- CRM Solutions – Data Warehousing – Data mining for CRM – an introduction to CRM software packages.

Text Books

1. Alok Kumar et al, (2015), Customer Relationship Management: Concepts and Applications, Biztantra
2. Jim Catheart, (2016), The Eight Competencies of Relationship selling, Macmillan India
3. Peeru H Mohamed and A Sahadevan, (2017), Customer Relationship Management, Vikas Publishing

Reference Books

1. Shainesh, Jagdish, N.Sheth, (2015), Customer Relationships Management Strategic Perspective, Macmillan
2. Zikmund, (2201), Customer Relationship Management, Wiley

SEMESTER II - (CORE ELECTIVE 2 (C))

INTERNATIONAL FINANCE

Course Objectives:
☐ To provide basic understanding of the fundamentals of international finance and familiarize students with international financial transactions and operational aspects of foreign exchange markets. It focuses on for-ex market participants, exchange rates determination, international arbitrage, foreign exchange risks and its management.

☐ It enables students to understand the crux of international financial market.

Course Outcomes:
CO –1: State and describe the accounting components of Balance of Payments.
CO –2: State and explain international capital and foreign exchange market.
CO –3: Identify risk related to exchange rate fluctuations and develop strategies to deal with them.
CO –4: Outline various foreign exchange rate regime and each of its advantages and drawbacks.
CO –5: Identify factors affecting International Trade flows.

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UNIT I INTERNATIONAL FINANCIAL ENVIRONMENT
Global Economy – Evolution, financial Globalization, rewards and risks, Openness of Indian Economy - International Monetary system, Multilateral financial institution – Overview, Importance and role in developing economies, Balance of Payments (BOP) – Fundamentals, Principles and its various components, The Current Account Deficit and Surplus

UNIT II FOREIGN EXCHANGE MARKET
Evolution of foreign exchange market -International Monetary System -Introduction- Forex Market participants- Foreign Exchange Rate regime-Fixed and Floating- Advantages and Disadvantages, Foreign Exchange Contracts - Spot and Forward Contracts – Swap and options, Forex Dealers/market makers and brokers-Forex Trading and SWIFT- Forex market in India- FERA Vs. FEMA

UNIT III EXCHANGE RATE DETERMINATION
Exchange Rate Determination - Exchange rate movements - Factors that influence exchange rates – Forward Rate and Cross Rate - Concepts of International arbitrage - Interest rate parity - Purchasing power parity - International Fisher effect.

UNIT IV INTERNATIONAL FINANCIAL MARKETS
International Financial Markets - basic concepts of the International Money Market –International Equity and Bond Market Foreign Trade Finance - Concept of foreign trade finance, Import licensing, Financing methods for import of capital goods, Export trade documents - Payment terms – Letter of credit, Pre shipment and post shipment finance, factoring, forfeiting and Countertrade.

UNIT V FOREIGN EXCHANGE EXPOSURE
Foreign Exchange Exposure- Translation Exposure – Definition and Types - Measurement, Management of Translation Exposure - Risk Associated with International Trade.

TEXTBOOKS:

1. Apte P.G., International Financial Management, Tata McGraw Hill, 2011.

2. Eun, Cheol S., Bruce G. Resnick, International Financial Management, McGraw-Hill, 6th edition, 2012, ISBN-13: 978-0-07-803465-7.

3. Jeff Madura, International Corporate Finance, Cengage Learning, 9th Edition, 2011.

4. Eiteman, David K., Arthus I. Stonehill, and Michael H. Moffett, Multinational Business Finance, Prentice Hall, 12th edition, 2009.

5. Alan C. Shapiro, Multinational Financial Management, PHI Learning, 10th Edition, 2013.

6. Levich, Richard, International Financial Markets, McGraw-Hill/Irwin, 2nd Edition, 2001.

INDUSTRIAL AND LABOUR RELATIONS

Learning Objectives:

- To know the development and the judicial setup of Labour Laws.
- To learn the salient features of welfare and wage Legislations.
- To learn the laws relating to Industrial Relations, Social Security and Working condition

Learning Outcome:

- Students will know the development and the judicial setup of Labour Laws.
- Be aware of the present state of Industrial relations in India.
- Be acquainted with the concepts, principles and issues connected with trade unions
- Collective bargaining, workers participation, grievance redressal, and employee discipline and dispute resolution. Understand the various processes and procedures of handling Employee Relations.
- Understanding basic worker welfare legislations.

UNIT-I

Industrial Relations Perspectives: Concept and Significance - IR Systems - Structure of IR dept. - Role of IR Officer - Industrial Relations and the Emerging Socio Economic Scenario

UNIT-II

Role and Future of Trade Unions; Trade Union and the Employee; Trade Union and the Management - Code of Discipline and Code of Conduct - Grievance Management

UNIT-III

Negotiation, Conciliation, Arbitration, Adjudication and Collective Settlements; Participative Management and Co-ownership; Productive Bargaining and Gain Sharing - Discipline - forms of indiscipline - Stages in disciplinary proceedings - punishment.

UNIT-IV

Collective Bargaining and Settlements including present status - Industrial Relations and Technological Change - ILO - Aims and Role in Promoting Industrial Peace

UNIT-V

Objective of workers Education - Recommendations of National Commission on Labour - Workmen Compensation Act, 1923 - Maternity Benefit Act - ESI Act - Legislation regarding gratuity - Provident Fund - Pension - Concept and Growth of Labour Welfare in India - Role, Responsibilities and Duties of Welfare officer.

Text Books

1. Dheodar, Punekar & Sankaran: Labour Welfare, Trade Unionism and Industrial Relation, Mumbai, Himalaya Publication, 1994

2. Mamoria C. B. & Mamoria S.; Dynamics of Industrial Relations in India; Mumbai, Himalaya Publication, 1994

3. P.R.N. Sinha, Indu Bala Sinha, Seema priyadarshini, Industrial Relations, Trade Unions and Labor Legilation, Pearson, New Delhi, 2010

4. Tripathi P.C.: Personnel Management & Industrial Relations, Sultan Chand & Sons, New Delhi, 2001.

5. A.M. Sarma Aspects of Labor welfare and Social Security, Mumbai, Himalaya Publication, 2010.

Reference Books

1. Gopal R. C.: An Introduction to Industrial Employment, Discipline & Disputes, New Delhi, Sultan Chand & Sons, 2001.

2. Nilland J.R. etc.: The Future of Industrial Relations, Sage Publications, New Delhi, Sage Pub., 1994.

3. Saxena R.C.: Labour Problems & Social Welfare, Meerut, K. Nath & Co., 1994.

SEMESTER II - (CORE ELECTIVE 2 (B))

CONSUMER BEHAVIOUR

Course Objectives:
1 To highlight the importance of understanding consumer behavior in Marketing.
2 To study the environmental and individual influences on consumers
3 To understand consumer behavior in Indian context.
 Course outcome:
- Student shall be able to learn and understand the importance of consumer behavior in marketing and differential consumer behavior in Indian context.
- To understand role of marketing in influencing consumer behavior.
- To analyze the role of marketer & the consumer in adverting.
- To sensitize the students to the changing trends in consumer behavior.
- To understand Post purchase Behaviour.

Unit–I: Consumer Behaviour Introduction

Consumer behaviour – Definition – scope – customer value – Customer satisfaction – Injurious consumption – Traditional marketing concept – Value and retention focused marketing – Models of Consumer Behavior – Nicosia, Howard sheth – Consumer benefits and evaluative criteria – Decision Heuristics

Unit–II: Consumer motivation, Personality

Needs – Goals – Discovering purchase motives – motivation research – Defense mechanism – Personality – Consumer innovativeness – Dogmatism – Cognitive personality factors – Personality and colour –Self image – Forms of self image – How general personality influence consumer behaviour

Unit–III: Consumer learning and Reference group appeal

Classical Conditioning – Instrumental Conditioning – Information Processing – Perceptual mapping – Tricomponent attitude model – Multi attribute attitude model
– Attribution – Consumer related reference groups – Brand communities – Family decision making process – Family life cycle.

Unit–IV: Consumer perception

Perception – Weber's Law – Selective perception – Figure and ground, grouping, closure – Perceptual distortion – Perceived risk – Perceived quality - Opinion leadership – Surrogate buyer – Diffusion of innovation – Adopter categories – Adoption process.

Unit–V: Purchasing Process and Post purchase behavior

Store location, Store design and Physical facilities – Store specific shopper profiles – In-store purchasing behaviour – Usage segmentation – Brand user, Product user, Loyalty, situation segmentation – Positive / negative Post purchase Behaviour – Complaint Behaviour.

References and Text Books:

1. Jay D. Lindquist, M. Joseph Sirgy, Shopper, buyer and Consumer Behavior, Biztantra, New Delhi, 2007.
2. Del I. Hawkins, Roger J. Best, Kenneth A. Coney, Amit Mookerjee, Consumer Behavior Building Marketing Strategy, 9/e, Tata McGraw-Hill, New Delhi, 2007.
3. Leon G.Schiffman, Kanuk Leslie Lazar, Consumer behavior, PHI Learning, New Delhi, 2008.
4. David L. Loudon, Albert J. Della Bitta, Tata McGraw-Hill, New Delhi, 2007.
5. Satish K Batra, S H H Kazmi, Consumer Behavior, Excel Books, New Delhi, 2008.
6. Michael R. Solomon, Consumer Behavior, PHI learning, New Delhi, 2009.
7. Wayne D.Hoyer, Deborah Maclnnis, Dasgupta, Consumer behavior, biztantra, New Delhi, 2008.

SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT

Objective:
- To understand the investment opportunities
- To equip the students with essential tools, techniques, models and investment theory necessary for analyzing different types of securities, making sound investment decisions and optimal portfolio choice.

Course Outcomes: After successful completion of this course the student should be able to:
- To provide an idea about investments and its various alternatives
- To enable the students to understand Shares and Debentures
- To create an awareness regarding investment Risk and return
- To make them understand about securities analysis and management
- To provide knowledge about portfolio investment and various theories in portfolio management

Unit-I

Investment – investment Vs speculation – characteristics of investments – investment opportunities – investment process – risk and return – measures of return – sources of risk – measuring risk – risk premium.

Unit-II

portfolio return and risk – diversification – modern portfolio theory – efficient portfolios – portfolio selection- capital market theory – capital market line – market portfolio – CAPM and Security market line – Arbitrage pricing theory – single index model.

Unit-III

Fundamental Analysis – factors consider in Economic Analysis – Industrial Analysis: Industrial classification according to business cycle – Industry life cycle analysis – key characteristics in an industry analysis – qualitative aspects of industrial analysis
– company analysis fundamentals.

Unit-IV

Common stock valuation – Dividend discount model – PIE model – relative valuation ratios. Efficient market theory – Forms of market efficiency – Evidence on market efficiency – implications of efficient market hypothesis.

Unit-V

Technical Analysis Vs Fundamental Analysis – underlying assumption of technical analysis – advantages – technical trading rules and indicators – momentum indicators – stock price and volume techniques Portfolio performance evaluation – risk adjusted measures of performance: style analysis.

Text Books

1. Donald E. Fischer and Ronald J Jordon: Security Analysis and Portfolio Management, New Delhi, Prentice Hall of India, 1990.

2. Robert A. Hanger: Modern Investment Theory, New Delhi, Prentice Hall of India (P) Ltd., 2002.

Reference Books

1. Bhalla V.K.: Investment Management; Security analysis and Portfolio Management, New Delhi, Prentice Hall of India, 6th Ed., 1995.

2. Bhalla V.K.; Financial Derivatives; New Delhi, S. Chand & Company Ltd., 1st ed., 2001.

3. Gordon J. Alexander, William F. Sharpe, Jeffery V. Bailey: Fundamentals of Investments, New Delhi, Prentice Hall of India (P) Ltd., 2002.

4. William F. Sharpe, Gordon J. Alexander, Jeffery V. Bailey: Investments, New Delhi, Prentice Hall of India (P) Ltd., 2002.

5. Charles P Jones, "Investment Analysis and Portfolio Management" Wiley Student edition, Wiley India Limited, 9th Edition, New Delhi.2008.

6. Reily and Brown, "Investment Analysis and Portfolio Management" South Western Cengage Learning, New Delhi.

7. Ranaganatham.M., and Madhumathi.R., "Investment Analysis and Portfolio Management" Pearson Education India Limited, 2008.

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THIRUVALLUVAR UNIVERSITY
VELLORE

CBCS PATTERN
MASTER OF BUSINESS ADMINISTRATION (M.B.A)
(Effective from the Academic year 2020-2021)

The Course of Study and the Scheme of Examinations

S. No	Study components		ins. hrs/ week	credit	Title of the paper	Maximum marks		
	Course title					CIA	Uni. Exam	Total
SEMESTER I								
1.	Core	Paper-1	6	4	Management Principles	25	75	100
2.	Core	Paper-2	6	4	Accounting for Managers	25	75	100
3.	Core	Paper-3	6	4	Managerial Economics	25	75	100
4.	Core	Paper-4	6	4	Research Methodology	25	75	100
Internal elective for same major students								
5.	Core Elective	Paper - 1	3	3	(to choose one out of 3) A. Business Communication B. Organizational Behavior C. Knowledge Management	25	75	100
External elective for other major students (inter/multi disciplinary papers)								
6.	Open Elective	Paper - 1	3	3	(to choose one out of 3) A. Communication Skills for Managers B. Compensation management C. Operation Research	25	75	100
			30	22		150	450	600
SEMESTER II						CIA	Uni. Exam	Total
7.	Core	Paper-5	6	4	Human Resource management	25	75	100
8.	Core	Paper-6	6	4	Financial Management	25	75	100
9.	Core	Paper-7	6	4	Marketing Management	25	75	100
Internal elective for same major students								
10.	Core Elective	Paper- 2	5	3	(to choose one out of 3) A. Operations Management B. Customer Relationship Management C. International Finance	25	75	100
External elective for other major students (inter/multi disciplinary papers)								
11.	Open Elective	Paper - 2	5	3	(to choose one out of 3) A. Industrial and Labour Relations B. Consumer Behaviour C. Securities Analysis and Portfolio Management	25	75	100
12.	Field Study		-	2		100	-	100
13.	Compulsory Paper		2	2	Human Rights	25	75	100
			30	22		250	450	700

					SEMESTER III	CIA	Uni. Exam	Total
14.	Core	Paper-8	6	4	Management Information System	25	75	100
15.	Core	Paper-9	6	4	Human Resource Development	25	75	100
16.	Core	Paper-10	6	4	Company Law	25	75	100
17.	Core	Paper-11	6	4	Modern Banking	25	75	100
Internal elective for same major students (choose any one)								
18.	Core Elective	Paper - 3	3	3	(to choose one out of 3) A. Training and Development B. Services Marketing C. Indirect Taxation	25	75	100
External elective for other major students (inter/multi disciplinary papers)								
19.	Open Elective	Paper - 3	3	3	(to choose one out of 3) A. Performance Management B. Retail Management C. Financial Markets and Institutions	25	75	100
20.	** MOOC Courses		-	-		-	-	100
			30	22		150	450	700

					SEMESTER IV	CIA	Uni. Exam	Total
21.	Core	Paper-12	6	5	Entrepreneurial Development	25	75	100
22.	Core	Paper-13	6	4	Business Environment	25	75	100
23.	Core	Paper-14	6	4	Quality Management	25	75	100
24.	Core	Project	6	5	Project with Viva Voce (**Compulsory**)	100 (75 Project + 25 Viva)		100
Internal elective for same major students								
25.	Core Elective	Paper- 4	3	3	(to choose one out of 3) A. Organizational Development B. Logistics and Supply Chain Management C. Banking- Indian Financial System	25	75	100
External elective for other major students (inter/multi disciplinary papers)								
26.	Open Elective	Paper - 4	3	3	(to choose one out of 3) A. Strategic Human Resource Management B. Brand Management C. Working Capital Management	25	75	100
			30	24		125	375	600
			120	90				2600

* Field Study

There will be field study which is compulsory in the first semester of all PG courses with 2 credits. This field study should be related to the subject concerned with social impact. Field and Topic should be registred by the students in the first semester of their study along with the name of a mentor before the end of the month of August. The report with problem identification and proposed solution should be written in not less than 25 pages in a standard format and it should be submitted at the end of second semester. The period for undergoing the field study is 30 hours beyond the instructional hours of the respective programme. Students shall consult their mentors within campus and experts outside the campus for selecting the field and topic of the field study. The following members may be nominated for confirming the topic and evaluating the field study report.

> (i). Head of the respective department
> (ii). Mentor
> (iii). One faculty from other department

**Mooc Courses

Inclusion of the Massive Open Online Courses (MOOCs) with zero credits available on SWAYAM, NPTEL and other such portals approved by the University Authorities.

MANAGEMENT INFORMATION SYSTEM

Course Objectives:

1. To develop conceptual understanding about latest developments in the field of Information Technology and the impact of I.T. in managing a business.

2. To learn to use Information Technology to gain competitive advantage in business.

3. To learn from, with a view to emulate, entrepreneurial ventures in e-Commerce and m-Commerce.

Course Outcomes:

Students shall be able to Understand the use of Information Technology with its impact in managing a business and gaining the competitive advantage in business.

- Understand the System concepts and the use of Information Technology.
- Understand the Information Reporting System.
- Understand the decision making process.
- Understand the use of Information Technology with its impact in managing a business and gaining the competitive advantage in business.
- Understand Societal challenges of Information technology

Unit-I

Foundations of Information Systems: A framework for business users - Roles of Information systems - System concepts - Organisation as a system - Components of Information Systems - IS Activities - Types of IS.

Unit-II

IS for operations and decision making: Marketing IS, Manufacturing IS, Human Resource IS, Accounting IS and Financial IS - Transaction Processing Systems-Information Reporting System - Information for Strategic Advantage – Introduction to data Management system – componants of DBMS – Types of models.

Unit-III

DSS and AI: DSS models and software: The decision making process - Structured, Semi Structured and Unstructured problems; Overview of AI, Neural Networks, Fuzzy Logic Systems - Expert Systems.

Unit-IV

Managing Information Technology: Managing Information Resources and technologies – IS architecture and management - Centralised, Decentralised and Distributed - EDI, Supply chain management & Global Information technology Management.

Unit-V

Security and Ethical Challenges: IS controls - facility control and procedural control - Risks to online operations - Ethics for IS professional - Societal challenges of Information technology.

Text Books

1. Steven Alter, Information Systlims - A Management Perspective Addison Wesley 1991.
2. James A O'Brein Management Information System Tata Mcgraw Hill New Delhi, 1991.
3. Kenneth C. Laudon and Jane Price Laudon Management Information system - Managing the digital firm, Pearson Education, Asia 2002 PHI.
4. Gordon B. Davis Management Information System Conceptual Foundations. Structure and Development, McGraw Hill 1974.

References

5. Turban Mc Lean and Wetherbe, Information technology for Management making connections for strategic advantage, John Wiley 1999.
6. Ralph M. Stair and George W. Reynolds, Principles of Information Systems - A Managerial Approach. Thomson Learning 2001.
7. Kendall & Kendall Systems Analysis and Design. Prentice Hall of India, New Delhi.
8. Panneerselvam, R , database management system Second Edition PHI Learning Pvt. Ltd., New Delhi, 2012.

PAPER - 9

HUMAN RESOURCE DEVELOPMENT

Objective: The objective of this course is to co-create a comprehensive view of Human Resource Development (HRD) through assessment of theories and practices of HRD.

Course Outcomes: The successful completion of this course shall enable the student:

CO1: To build an understanding and perspective of Human Resource Development as discipline appreciating learning.
CO2: To learn the skills of developing a detailed plan for need and implementation of HRD program in the organization.
CO3: To learn role of learning in action as an individual, group and an organization in order to develop creative strategies to organizational problems.
CO4: To develop a perspective of HRD beyond organizational realities including national HRD.
CO5: To understand contemporary realities of HRD and its interface with technology.

Unit I-

Introduction to Human Resource Development: Historical perspective, contemporary realities and future of HRD; Andragogy and life-long learning; Integrating learning with work.

Unit II-

Human Resource Development Process: Assessing need for HRD; Designing and developing effective HRD programs; Implementing HRD programs; Evaluating effectiveness of HRD programs.

Unit III-

Human Resource Development Activities: Action learning, assessment and development centers; Intellectual capital and HRD; Role of Trade Unions; Industrial relations and HRD.

Unit IV-

Policy perspective of Human Resource Development: National HRD, workforce development, strategic HRD, talent management and leadership development.

Unit V-

HRD Trends: Emotions and self-development; Integrating HRD with technology coaching and mentoring; Competency framework of HRD- Understanding the competency mapping framework, analyzing steps in competency mapping; Balanced score card, appreciative inquiry.

Text Books
1. Mankin, David (2009). *Human Resource Development*. Delhi: Oxford University Press.
2. Rao, T.V. (2005). *Future of HRD*. Macmillan Publishers India.
3. David McGuire, Human Resource Development: Theory and Practice- SAGE Publications- 2011

Reference Books
1. C.B. Mamoria, S.V. Gankar, Human resource management, Himalaya Publishing House, Mumbai, 2006.
2. Gary Dessler, Biju Varkey, Human Resource Management Pearson Education, Delhi, 2009.
3. Rao .P.L, Comprehensive human Resource management, Excel Books, new Delhi, 2006.
4. Subba rao, P., Personal and Human resource Management, Himalaya Publishing House, Mumbai, 2004.

PAPER - 10
Company Law

Objectives:

- To acquire knowledge about the regulatory framework of companies

- To know about the different kinds of shares and debentures

- To identify the various managerial personnel of the company

- To gain knowledge about arranging meetings and resolution passing procedures

- To make the students understand about recent amendments of winding-up a company

Learning outcome:

- Students would be able to understand the meaning and basic characteristics of company and how it differs from other forms of businesses,

- Students will be equipped on the issue of shares, bonus and rights shares

- Able to identify the independent directors and key managerial personnel of the company

- Students could get sound knowledge on various kinds of meetings and resolutions

- Can acquire knowledge about various methods of winding-up of a company.

UnitI: JointStockCompany

Meaning - Kinds of Companies (Special Provisions with respect to PrivateCompany, Public Company, OnePersonCompany,Small Company,Dormant Company) - Formation- MemorandumofAssociation-Contents-Restrictionon"OtherObjects"- DoctrineofUltraVires- ArticlesofAssociation-Contents-Prospectus-Contents-Types (StatementinLieuofProspectus,shelfProspectus,RedHerringProspectus)- Underwriting- BookBuildingProcess-GreenShoeOption-E-Filing-Dematerialisation.

Unit II: Share Capital and Debentures

Meaning of Shares- Kinds of Shares- Voting rights-Issue of shares at a Premium and Discount-Partly paid shares- Bonus Shares- Rights shares-Sweat Equity Shares. Debentures-Meaning-Types.

Unit III: Managerial Personnel

Directors-WomenDirectors-IndependentDirectors-DirectorIdentificationNumber- Other Key Managerial Personnel- Related Party Transactions.

Unit IV: Meetings and Resolutions

Meeting-StatutoryMeeting-AnnualGeneralMeeting-ExtraordinaryGeneralMeeting- NoticeofMeeting-Quorum-Proxy-BoardofDirectorsMeeting-Committee-Typesof Committee-Audit Committee-Stake Holders Relationship Committee- Corporate Social Responsibility Committee. Resolutions-Ordinary Resolution- Special Resolution -Resolution requiring special notice.

Unit V: Winding up of Company

ModesofWindingup-WindingupbytheCourt-VoluntaryWindingup-Types-Members Voluntary Winding up-Creditors Voluntary Winding up. National CompanyLawAppllate Tribunal.

Text Books

1.Kapoor,N.D.,BusinessLaws,SulthanChandandSons,NewDelhi.

2.Sreenivasan,M.R.BusinessLaws,MargamPublications,Chennai.

3.Dhandapani,M.V.BusinessLaws,SultanChandandSons,NewDelhi.

4.AvatarSingh, CompanyLaw, Eastern Book Company

5.Shukla,M.C.&Gulshan,S.S.,PrinciplesofCompanyLaw

6.BadriAlam,S&Saravanavel,CompanyLaw,HimalayaPublications

7.Gogna,P.P.S.,TextBookofCompanyLaw,S.Chand&Co.

8.Gaffor&Thothadri,CompanyLaw,Vijay NicoleImprintsPvt.Ltd.Chennai

References Books

1. P. Saravanavel & S. Sumathi, Legal System In Business, Himalaya Publishing House, New Delhi.

2. N.D.Kapoor, Elements of Mercantile Law, Sultan Chand & Company, Delhi.

3. Sen & Mitra, Commercial and Industrial Law, The World Press Pvt., Ltd., Calcutta.

4. P.K.Ghosh & V.Balachandra, Company Law & Practice, Sultan Chand &Sons, New Delhi.

5. S.C.Srinivastava, Industrial Relations & Labour Laws, Vikas Publishing House Pvt., Ltd., New Delhi.

6. R.S.N.Pillai & Bagavathi, Business Law, S.Chand & Company Ltd., New Delhi.

7. Banking Law and Practice, Varshney.

PAPER - 11
Modern Banking

Course Objective:

1. To provide the students with the latest development in the field of Banking and Financial System.
2. To evaluate the theories relating to the role of banks as financial intermediaries.
3. Understand the role of transactions costs and informational asymmetries in the operation of the banking system.
4. To understand how bank-based systems differ from market-based systems.
5. To enhance and analyses the various bank performance measures.

OUTCOME:

1. To enhance the functions of Commercial Banks and Central Bank.
2. To learn the various types of deposits.
3. To understand the E-Banking and Internet Banking & Mobile Banking
4. To enhance Electronic fund transfers system.
5. To learn about Electronic payment systems

Unit – I:

Banking – Meaning – Definition – History of Banking – Banking System - Unit Banking Branch Banking - Mixed Banking –Commercial Banking – Functions - Credit Creation – Money Market – Characteristics – Constituents of Indian money market.

Unit – II:

Central Banking – Functions – Credit Control Devices – RBI – Functions – Different Departments of RBI.

Unit – III:

Nationalizations of Commercial Banks – Causes – Achievements – Pitfalls – SBI – SBI Groups – Functions – SBI and Industrial finance – SBI Rural Finance – RRBs - Functions – Co-operative Banks – Co-operative Credit Structure – Achievements of Co-operative Banking – Challenges.

Unit – IV:

E-Banking – Meaning - Benefits – Internet Banking Services – Drawbacks – Mobile Banking – Features – Drawbacks – Call Centre Banking – Features – Challenges – ATM – Types - Features – Benefits – Challenges – Credit Cards – Benefits – Constraints – Debit Card – Benefits – Smart Card – Features – Biometric Cards – Features – MICR Cheques – Benefits.

Unit – V:

Electronic Fund Transfer (EFT) - RBI Guidelines – Benefits of Electronic Clearing Systems – E-Cheques – E-Money – Real Time Gross Settlement (RTGS) – Benefits to Banker and Customer – Cheque Transaction – Core Banking Solutions (CBS) – Benefits – Single Window Concepts – Features.

Text Books

1. K.P.M.Sundaram and E.N.Sundaram, Modern Banking, Sultan Chand & Sons, new Delhi.
2. Dr.S.Gurusamy, Banking Theory Law and Practice – Vijai Nicole Publications.
3. Shekhar & Shekhar, Banking and Financial System, Margham Publications, Chennai – 17.
4. Radhaswami and Vasudevan, A Text book of Banking (Law, Practice and Theory of Banking).

Reference Books

1. B.Santhanam, Banking and Financial System, Margham Publications, Chennai -17.
2. Vijaya Iyengar, Introduction to Banking – Excel Book Publication, New Delhi.
3. S.K. Baral, Modern Bank Management, Skylark publications - Delhi.
4. Principles and Practice of Banking - Macmillan New Edition.

PAPER - 3
A. TRAINING AND DEVELOPMENT

Objectives:

1. To select appropriate training methods based on training objectives, trainee characteristics, and organizational constraints
2. To conduct needs assessment to determine whether and what kind of training is necessary.
3. To evaluate and create conditions to ensure employees' readiness for training.
4. To determine and discuss the strengths and weaknesses of presentation, hands-on, and group training methods.
5. To understand how assessment, relationships, courses, and job experiences can be used for development

Course outcomes:

1. Learn the practical applications of training and development theories in recent times.
2. Learn to design training programmes for diverse workforce.
3. Understand the role of development officers.
4. Evaluate training and development programmes.
5. Recognize the mechanism of career development programmes

Unit–I : Introduction

Concepts of training and development – Learning principles – Learning curve – Identifying training needs – Structure and functions of training department – Evaluation of Training programme – Role, Responsibilities and Challenges to Training Managers.

Unit–II : Training Techniques

Techniques of on the job training – Coaching – Apprenticeship – Job rotation – Job instruction Training – Training by supervisors – Techniques of off the job training; Lectures, Conferences, Group, discussion – Case studies, Role playing, Programmed instruction, T-Group Training – Simulation, Brain Storming, Audio visual lessons – In basket games, Transcendental meditation and Psychodrama.

Unit–III : Career – Planning

Concept of Career – Career Stages - Career planning and Development – Need – Steps in Career planning – Methods of career planning and Development – Career problems and solution – Guidelines for Career Management

Unit–IV : MDP

Concept of management development programme – Components of MD programme. Management Development Institute: Productivity councils – Management Associations – Educational Institute – Consultant – Critical appraisal of training and development programme in India.

Unit–V : Training Institutions

Need for Training in India – Government – policy on Training – Training institutes in India – Management development programmes in public sector and private sector organizations.

Text Books

1. Rolf Lynton, Udai Pareek: Training for Development, New Delhi, Sage Publications India (P) Ltd., 1990.

2. Raymond Andrew Noe: Employee Training & Development, New Delhi, Tata McGraw Hill, International Ed., 1999.

3.   Lynton, R Pareek, U.: Training for Development, New Delhi, Vistaar, 2nd ed., 1990.

Reference Books

1. Rao PL: HRD through In-House Training, New Delhi, Vikas Publishing House (P) Ltd., 1998

2. Reid, M.A.: Training Interventions: Managing Employee Development London, IPM, 3rd ed., 1992.

3. Aggarwala, D. V., Manpower Planning, Selection, Training and Development, New Delhi, Deep & Deep Publications (P) Ltd., 1999.

CORE ELECTIVE

PAPER - 3
B. SERVICES MARKETING

Course objective

- To facilitate a thorough understanding of services marketing

- To explore marketing strategies for service firms

- To discuss the varies pricing methods of services

- To describe the services marketing in non-profit firms

- To give importance of customer relationship marketing in servicing firms

Learning outcome

- Knowledge on classification of services

- Familiarity on marketing strategies in service firms

- Obtain knowledge in innovation in services

- Gain information on marketing of non-profit firms

- More ideas on customer relationship management

UNIT I

Nature and classification of services - Characteristics of services and their marketing implications.

UNIT II

Marketing strategies for service firms - with special reference to information, communication, consultancy, advertising, professional services, after - sales service, recruitment, training and tourism.

UNIT III

Product support services - pricing of services - problems of quality - innovations in services.

UNIT IV

Marketing of financial services – nature – types - marketing of insurance - mutual fund - marketing for non-profit firms.

UNIT V

CRM & Relationship Marketing Customer Satisfaction.

Text Books

1. Christopher H Lovelock & Lawren Wright, "Principles of Services Marketing and Management", Pearson Education.
2. Bateson E G, "Managing Services Marketing - Text and Readings", Dryden Press, Hinsdale 111, 1989.
3. Philip Kotler and Paul N. Bloom, "Marketing Professional Services", Prentice Hall, New Jersey, 1984.

Reading Books

1. Payne, "The Essence of Services Marketing", New Delhi, Prentice Hall, 1994.
2. Berry Dick, "Managing Service for Results", New York, ISA, 1983.
3. Lovelock, C.H., Managing Services, Englewood Cliffs, N.J., Prentice Hall, 1988.
4. Karen P Coronclaves, "Services marketing – A Strategic Approach", Pearson Education.
5. Woodruffe, "Services Marketing", Pearson Education.

Zeithaml, Valarie A., "Services Marketing", McGraw-Hill Publishers

CORE ELECTIVE

C. Indirect Taxation

Course Objectives

- To get familiarise with the direct and indirect taxation system in India

- To know about the need and benefits of GST

- To gain information about the provisions under GST

- To know about the assessment and audit of GST

- For acquiring information about the levy and collection of customs duties

Learning outcome:

- Candidates will get insights on objectives of taxation, powers of states to levy taxes

- Students would be able to know the taxes covered by GST, scope and types of supply

- Able to understand the administrative structure of GST, officers, jurisdiction and appointment powers

- Could be with a good knowledge on demands, recovery, appeals, revision and penalties under GST

- Students could acquire information about the customs officers, powers and types of customs duty

UNITI:
Introduction

History and Objectives of Taxation- Canons of Taxation-Tax system in India-Direct and Indirect Taxes-Meaning and Types - powers of Union and States to levy taxes

UNIT – II GST – Overview & Concepts

Background behind implementing GST- The need for GST- Business impact- Objectives and Benefits of GST-SGST- CGST and IGST- Taxes covered by GST- Definitions - Scope and Coverage Scope of supply- Levy of tax- Rate Structure- Taxable Events - Types of Suppliers - Composite and Mixed Supplies - Composite Levy - Cross empowerment

UNIT – II GST Taxation/ Assessment proceedings

Return- Refunds- Input Tax Credit- Reverse charge Mechanism, Transitional Provisions composition under GST- Administrative structure of GST-Officers as per CGST Act- Officers as per SGST Act-Jurisdiction- Appointment Powers.

UNIT-IVGST Audit

Assessment and Audit under GST- Demands and Recovery- Appeals and revision- Advance ruling Offences and Penalties - NAPA (National Anti-Profiteering Authority)

UNIT-V Customs duty

The custom duty- Levy and collection of customs duty- Organisations of custom departments-Officers of customs- powers- Appellate Machinery- Infringement of the Law-Offences and Penalties- Exemptions from duty customs duty draw back- duties free Zones - Export Incentive Schemes

Note: All Units only Theory

Text Books

1.Sweta Jain, GST law and practice Taxmann Publishers, July 2017
2. Daty V S, GST- Input Tax Credit- Taxmann Publishers, second edition August 2017
3. Anurag Pandey- Law and Practice of GST- Sumedha Publication House 2017
4. Vandana Banger- Beginners- Guide AadhayaPrakashan Publisher 2017

Reference Books

1. Govindarajan- A practical guide send text publishers July 2017
2. Datta, D C, Layman's Guide on GST, Taxman Publications
3. Reddy &Dr.Y. Hariprasad Reddy, Business Taxation, MarghamPublications, Chennai
4. Balachandran K, GST and Customs Law, Vijay Nicole Imprints, Chennai

Paper - 3
(to choose one out of 3)

A. PERFORMANCE MANAGEMENT

Course Objective:
- This paper aims to impart the understanding about the performance management system and strategies adopted by the organizations to manage employees' performance.
- This paper also intends to give insights on how to identify, integrate, and retain talent in an organization to deliver high performance.
- To examine the importance of an effective performance management system in helping organizations define and achieve long term and short term goals vital to its overall success.

Course Outcome
CO – 1: To study the role of performance management in an organization.
CO – 2: Compare and contrast various organizational performance management programs and best practices and define attributes of effective performance management systems.
CO – 3: Employ job-related performance standards and performance indicators that reflect the employees range of responsibilities.
CO – 4: Assess how increased employee involvement can contribute to effective performance and coach employees to identify career paths and resources available to support individual development.
CO – 5: Arrange the appropriate current trend in performance management system.

UNIT I INTRODUCTION
Definition, concerns and scope - Historical developments in Performance Management - aims and role of PM systems, characteristics of an ideal PM systems, performance management process, Performance appraisal Vs performance management

UNITII PERFORMANCE APPRAISAL SYSTEMIMPLEMENTATION Setting objectives - Organisational and individual performanceplans - determinants of performance Components of Managingperformance and development plan - setting mutual expectations andperformance criteria.approaches to measuring performance, diagnosing the causes of poor performance.

UNIT III CONDUCTING STAFF APPRAISALS
Purpose of Appraising - Methods of appraisal, objectives, skill required, the roleof the appraiser, job description & job specification, appraisal methods, raters errors, data collection, conducting an appraisal interview, follow up & validation.

UNIT IV PERFORMANCE MANAGEMENT & EMPLOYEE DEVELOPMENT
Personal Development plans, 360 degree feedback as a developmental tool performance management & reward systems; performance linked remuneration system, performance linked career planning & promotion policy.

UNIT V.

CURRENT TRENDS IN PERFORMANCE MANAGEMENT SYSTEM Performance Consulting, concept, organizing performance improvement department, Potential appraisal use of technology, issues and concern in performance management.Building and leading High performing teams – team oriented organizations - developing and leading high performing teams.

Text Books:
T.V. Rao: 'Performance Management and Appraisal Systems'; Response Books;
2011.
Chadha, Performance Management: It's About Performing – Not Just Appraising,
McMillan India Ltd, 2003.

References:
Herman Aguinis, Performance Management, Pearson Education, 2012.
Dixit Varsha, Performance Management, Vrinda Publications Ltd, 2009
Michael, Armstrong, Performance Management, Kogan Page, 2003

B. RETAIL MANAGEMENT

Course objective:

1. To bring out the importance of traditional retailing-brick and Motor stores.
2. To create awareness on various retailers strategies.

Course outcome:
- Illustrate the various types of retailing formats.
- Educate them with the importance of retailers and manufacturers brands
- Emphasize the importance of retail location.
- Learn the strategy to improve on the retail promotion.
- Update the latest technological intervention in retailing.

Unit-I

Retailing - An introduction: Definition, Functions, Importance, Types of retailing - Store and Non Store; Retailing in India - Current Scenario, Retailing from International perspectives; Consumer buying decision process - influencing factors, Consumer shopping behavior.

Unit-II

Retail planning - Purpose, method, structure and monitoring the plan; Retail brand management- positioning, personality, Types of brand, Brand and life cycle; Merchandise management - Meaning, Methods, Assortment and Inventory; Purchase negotiation, Supply channel and relationship, SCM principles, and retail logistics.

Unit-III

Retail location decision - Trading area analysis, Types of location Site evaluation; Store design - layout and space management, Visual merchandising and displays; Retail pricing - approaches, influencing factors, Price sensitivity, and mark down policy.

Unit-IV

Retail promotion - setting objectives, Role of advertisiting, sales promotion, personal selling public relations and relationship marketing in retailing; Human resource issues and considerations; Customer service management.

Unit-V

Impact of information technology in retailing - Integrated systems and Networking EDI, Bar Coding, Customer database management. Electronic retailing - Role of web, on line retailing, Factors to be considered in having a Web site, limitations of web and future trends; Consumerism and Ethics in retailing - Social and Green issues; Retail audit.

Reference and Text Books

1. Berman and Evens, *Retail Management*, PHI.
2. David Gilbert, *Retail Management*, Financial Time/Prentice Hall.
3. Gibson Vedamani, *Retail Management*, Jaico Books.
4. Levy & Weitz, *Retail Management*, Tata McGraw Hill.

OPEN ELECTIVE

Paper - 3

C. Financial Markets & Institutions

Course objectives

- To make an introduction about the basic concepts of capital and financial markets

- To impart knowledge on the working of commercial paper market, including bill market

- To teach the students on the evolution and growth of capital market

- To acquaint the students with the knowledge on the functioning of various financial institutions such as NABARD, EXIM bank, etc

- To make students understand the working of various credit rating agencies such as CRISIL, CIBIL, DFHIL

Learning outcome:

- After learning the chapter, students will be equipped with information on money market, financial instruments and capital market

- Students would be knowing about bill market, certificate of deposit market and gilt-edged securities market

- Able to understand the capital market instruments, new issues market, debt and bond market

- Candidates could gain knowledge on credit and risk management

- Able to get basic idea on the functions and services of IMF, world bank, ADB, EXIM bank and SEBI

Unit I Introduction:Financial markets - meaning - definition - role - functions - constituents - financial instruments - capital market instruments - Indian money and capital markets - global financial markets - **Money market:** meaning - characteristics - importance - general functions - segments - financial institutions - characteristics of developed money market - global money markets - **Call money market:** meaning - features - benefits - Indian call money market - call money rates - **Commercial paper market:** meaning - features - Satellite Dealers (SDs)

Unit II Commercial paper market: meaning - importance - developed bill market - shortcomings of Indian bill market - Bill Market Scheme, 1952 - Bill market Scheme, 1970 - IDBI Bill Rediscounting Scheme - Reasons for the failure of bill market scheme - revitalizing bill market - **Certificate of Deposit (CD) market:** meaning - features - time deposit Vs certificate of deposit - role of DFHI - Treasury Bill Market: meaning - Treasury Bills - general features - Indian TBs - Benefits - **Gilt-edged securities market:** meaning - features - Repos, government bonds - importance of gilt-edged market

Unit III Capital Market: meaning –characteristics – evolution and growth – new financial instruments – major issues – **Capital market instruments** – meaning – types – preference shares – equity shares – non-voting equity shares – company fixed deposits – warrants – debentures and bonds – global debt instruments – **New Issues Market (NIM)** – meaning – NIM and secondary

market – methods of marketing securities – intermediaries in NIM – Debt market – meaning – advantages – risks on debt – role of bond market – price determination – yield of bond

Unit IV Financial service institutions – **Clearing Corporation of India Limited** – settlement of risks – risk management system – benefits –**CRISIL** – range of services – **CIBIL** – credit information – credit assessment – mechanism – defaulted credit facility –access to CIBIL information – credit information report – **DFHIL** – ICRA – Moody's Investor Service – Standard & Poor – Fitch Ratings – OTCEI – NSDL – STCI

Unit V Financial Institutions–meaning – special characteristics – money market institutions – capital market institutions – cooperative banking institutions –**National Housing Bank** – functions and working – **EXIM bank of India** – functions and working – NABARD – functions and working – RBI – functions and working – NBFCs – FIIs – role and danger – IMF – World Bank – IFC – ADB – Stock exchange – meaning – functions traders – role of SEBI – stock trading – regulatory framework – Insider trading – speculation – Investor protection – listing – SBI – functions and working

Text Books

1. **MEIR KOHN, (2004), '**Financial Institutions and Markets**'**, Oxford University Press, New Delhi

2. **BHOLE L M AND JITENDRA MAHAKUD**, (2012), Financial Institutions and Markets, McGraw Hill Education, New Delhi

3. **GURUSAMY S, (2015), '**Financial Markets and Institutions', Vijay Nicole Imprints Ltd, Chennai

4. **ANTHONY SAUNDERS AND MARCIA MILLAN CARNET**, (2010), 'Tata McGraw Hill Publishing Company, New Delhi

Reference Books

1. **ROSE, PETER S., AND FRASER, DONALD R**, (2000), 'Financial Institutions: Understanding and Managing Financial Services", Tex Business Publications, New York

2. **KINSELLA, RAY,** (2009), 'New Issues in Financial Services, Powell's Books, London

3. **KHAN M Y,** (2001), 'Financial Services', Tata McGraw Hill, New Delhi

SEMESTER IV
PAPER – 12
Entrepreneurial Development

To enrich the students towards the knowledge of entrepreneurial skills and to make the students understand the approaches to attain the goals of the business.

Course Outcomes

- To aiming to develop students about Role and Responsibility of Entrepreneurs in Indian context.
- To create an awareness on various Entrepreneurship Development Programme
- To enable them to understand project formulation
- To familiarize the students with various financial institutions.
- To enable them to understand Growth Strategies in Small Business.

Unit–I

Definition - Concept - Classification and types of entrepreneurs - Entrepreneurial Traits – Entrepreneurial scene in India - Role and Responsibility of Entrepreneurs in Indian business context –Factors influencing Entrepreneurship – Achievement Motivation – Entrepreneurial Development Programme: Role and objectives of the EDP programme.

Unit–II

Women Entrepreneurship –Concept, Functions, Growth and problems of Women Entrepreneurship – Strategies for the development of women entrepreneurs - Rural Entrepreneurship –Meaning, Need and Problems of Rural Entrepreneurship.

Unit-III

Project Identification and Selection - Project Formulation – Project Appraisal – Financing of Enterprise.

Unit–IV

Institutional Finance to Entrepreneurs – Commercial Banks and Other Financial Institutions – IDBI – IFCI – ICICI – LIC – UTI – SFC – Institutional Support to Entrepreneurs – SIDO – DICs – SISI - TCOs.

Unit–V

Growth Strategies in Small Business – Sickness in Small Business – Export Documents and procedure for small business – E-Commerce and Small Enterprises .

Text Books:

1. Clifford F. Gray, Erik W. Larson, Project Management, Tata McGraw Hill, New Delhi, 2007.

2. Prasanna Chandra, Projects, Tata McGraw Hill, New Delhi, 2007.

3. Nagarajan. K. Project Management, New Age International Publishers, New Delhi, 2007.

4. Narendra Singh, Problems and Solutions in Project Management and Control, Himalaya Publishing House, 2007.

5. Gobalakrishnan. P., & V E Ramamoorthy, Project Management, Macmillan India Ltd, New Delhi, 2006.

6. Poornima M charantimath, Entrepreneurship development and small business enterprises, Pearson Education, New Delhi, 2007.

7. Khanka. S.S. Entrepreneurial Development, S Chand & Company, New Delhi, 2008.

8. Vasant Desai, Dynamics of Entrepreneurial Development and Management, Himalayas Publishing House, New Delhi, 2008.

9. Robert D. Hisrich Michael P. Peters, Dean A Shepherd, Entrepreneurships, Tata McGraw Hill, New Delhi, 2007.

Reference Books:

1. Sahay. A. & A. Nirhar, Entrepreneurship, Excel Books, New Delhi, 2007.

2. Joy. P.K., Total Project Management – The Indian Context, Macmillan India Ltd, New Delhi, 2006.

3. Sonatakki. V.C., Project Management, Himalayas Publishing House, New Delhi, 2008.

PAPER - 13

Business Environment

Course Objective

1. To understand the concept of business environment as well as internal and external components.
2. To understand the conceptual framework of income, saving and investment trends in the economy.
3. To understand the concept of international trade and balance of payment.
4. To understand the concept of inflation and parallel economy.
5. To study about monetary policy, industrial policy and privatization.

OUTCOME:

1. To learn the various elements internal as well as external affecting business environment.

2. To enhance the techniques like SWOT analysis.

3. To students learn the terms like inflation, GDP, etc.

4. To learn the consequences with regard to BOP.

5. To learn economic trends and effect of Govt. policies as LPG

Unit – I:

Business Environment – Definition- Importance- Dimension of business environment: Economic, Social, Cultural, Political, Legal, Demographic, Natural and Technological Environment

Unit – II:

Political and Economic Environment - Economic systems – Capitalism – Socialism – Mixed economy - Features, Merits & limitations of each – Role of Government in business : regulatory role-promotional role , entrepreneurial role and planning role – Constitution of India – The preamble – The fundamental rights – The Directive Principles

Unit- III:

Industrial policy Resolutions in India - Meaning – Need & Importance of Industrial policy - Industrial policy resolutions 1948 & 1956 – The New Industrial policy 1991 – Features – Meaning of Liberalization, Privatization and Globalization

Unit- IV:

Global Environment - Meaning – Merits and Demerits of Globalization – GATT (General Agreement on trade and tariff) – Meaning, Objectives – WTO and its functions - MNCs (Multinational Companies) – Benefits and limitations of MNCs.

Unit- V:

Social Responsibility of Business - Concept – Responsibility to shareholders ,Employees, Consumers and community –Overview of CSR Business ethics- meaning and importance.

<u>**Text Books**</u>

1. Business Environment - Francis Cherunilam, Himalaya Publishing House-2011, Mumbai-400 004.
2. Buiness Environment-Sahitya Bhawan Publications- Revised Edition 2017,
3. Business Environment - Dr.K.Chidambaram&Dr.V.Alagappan, Vikas Publishing House Pvt Ltd-2007 New Delhi.
4. Essentials Of Business Environment - K.Aswathappa, Himalaya Publishing House.-2005

<u>**Reference Books**</u>

1. Gerry Johnson & Kevan scholes, Exploring Corporate Strategy: Text & Cases, Prentice Hall India.

2. Jauch.L., Rajive Gupta & William.F.Glueck, Business Policy and Strategic Management, Frank Bros&Co., 2003.

3. Fred R.David, Strategic Management Concepts & Cases, Pearson, 2003.

4. R.Srinivasan, Strategic Management, II edition, Prentice Hall of India, New Delhi.

PAPER – 14

QUALITY MANAGEMENT

Course objective:
- To understand the success factors, the principles for successful implementation of
 Quality Management.
- To understand the tools and technique for implementation of TQM in any industry.
- To create awareness about the ISO certification process and new trend like Six Sigma.

Course outcome:
At the end of the course the students will be able to:
CO – 1: Define the quality based on the quality gurus.
CO – 2 Acquire knowledge on the various techniques of TQM
CO – 3: Recognize the implementation of SPC tools.
CO – 4: Degree of variation, defect and opportunity based on six sigma.
CO – 5: understand the concept of BPR.

UNIT-I
Stages of quality control, History of quality, Quality management and its importance, Contributions of quality gurus, Impact of quality on business performance, Distinction between product quality and service quality, Desirable qualities of a leader, Leadership grid, Quality information system, Strategy development and deployment, Need for quality approach to strategy, Quality and its types, Supporting policies

UNIT II
Functions of human resource management (HRM), recruitment and selection, Training Methods, quality circles- Steps of quality circle meetings, Implementation of quality circle, Rewards and recognition, Customer Focus - Customer focus Vs Process focus, Internal customers and management, Quality edge, Factors affecting customer satisfaction, Role of marketing for customer satisfaction, Importance of customer retention, Impact of Customer Retention on Profitability, Steps of developing customer focus

UNIT III
_ Process and Statistical Quality Control- quality system, control chart for variables (X and _R) and (X and S charts), control charts for attributes (p, c and u charts), Six Sigma - elements of sig sigma, DMAIC Methodology, DMADV Methodology, six sigma technical tools, Benchmarking - types of benchmarking, stages of benchmarking process, Cost of quality- Activity based costing, Business performance management - performance measures and their importance, balanced score card, quality control activities during product cycle and balanced score card.

UNIT IV
Total productive maintenance - objectives of TPM, performance measures of maintenance system, pillars of TPM, stages of implementation of TPM , reliability, Failure modes and effects analysis (FMEA), - Introduction to ISO Series..

UNIT V
Business process reengineering- steps of business process reengineering, measures of performance of BPR, applications of BPR, Building and sustaining total quality .

Text Books:

1. Panneerselvam, R. and Sivasankaran, P., Quality Management, PHI Learning, New Delhi, 2014.
2. Besterfield, D.H., Carol Bsterfield- Michna, Besterfield, G.H., Mary Besterfiled-Sacre, Total Quality Management, Pearson Education, Inc., USA, 2003.

References

3. Feigenbaum, A.V., Total Quality Control, McGraw-Hill, New York, 1983.
4. Phillip J. Ross, Taguchi Techniques for Quality Engineering, Tata McGraw-Hill (Second Edition), New Delhi, 2005.
5. Saaty, T.L., Fundamentals of Decision Making and Priority Theory with the Analytic Hierarchy Process, Vol.6, RWS Publications, Pittsburg, PA., 2000.
6. Summers, C.S., Quality Management: creating and Sustaining Organizational Effectiveness, Prentice-Hall of India, New Delhi, 2005.

A. ORGANISATIONAL DEVELOPMENT

Objective: To prepare the students as organizational change facilitators using the knowledge and techniques of behavioral sciences and understand the applicability of OD interventions to be facilitated through case-studies.

Course Outcomes: The successful completion of this course shall enable the student:

CO1: To understand the need and philosophy of organization change and development in the changing times.
CO2: To learn OD as an applied field of change.
CO3: To understand techniques of collection and analyses of organizational diagnosis information and the significance of feedback in delivering diagnostic information.
CO4: To comprehend designing and evaluation of different types and levels of interventions and their ability to address organization"s survival.
CO5: To explore the role of OD in addressing issues relating to globalization, OD research-practice interface and challenges faced by OD.

UNIT-I

Introduction to Organisation Development:- Concepts, Nature and Scope of O.D. : Historical Perspective of O.D. - : Underlying Assumptions & Values Theory and Practice on change and changing - The Nature of Planned Change - The Nature of Client Systems : Group Dynamics, Intergroup - Dynamics and Organisations as Systems.

UNIT-II

Operational Components of O.D - Diagnostic, Action and Process - Maintenance components.

UNIT-III

O.D.Interventions: - Team Interventions - Inter-group Interventions - Personal, Interpersonal and group process interventions - Comprehensive interventions - Structural Interventions.

UNIT-IV

Implementation and assessment of O.D - Implementation conditions for failure and success in O.D. - efforts. - Assessment of O.D. and change in organisational performance - The impact of O.D.

UNIT-V

Some key considerations and Issues in O.D - Issues in consultant - Client relationship - Mechanistic & Organic systems and contingency approach - The future of O.D. - Some Indian experience in O.D

References :

1. Wendell L.French & Cecil H. Bell,Jr.Organization Development, PHI Fourth edition.

2. French, Bell and Zawacki - Organization Development Theory, Practice and Research Universal Book Stall, Third Edition.

CORE ELECTIVE

Paper - 4

B. LOGISTICS AND SUPPLY CHAIN MANAGEMENT

Objectives:

1. To understand the strategic role of logistics management

2. To study the important modes of logistics operations

3. To Know supply chain techniques in an international perspective.

Learning Outcomes:

1. Able to Understand the basics of Logistics and Supply chain Management.

2. Able to Understand the different modes of Transportation.

3. Able to Understand the concept of Containerization .

4. Able to Understand the strategic role of Logistics and Supply chain Management in the cost reduction and offering improved service to the customers.

5. Combining the traditional physical distribution activity with modern Information Technology to have sustainable competitice advantage to the organization Globally.

Unit I

Logistics management and Supply Chain management - Definition, Evolution, Importance. The concepts of logistics andSupply Chain Management, Key Drivers of Supply Chain Managementand Logistics relationships.

Unit -2

Basics of Transportation, Transportation Functionality and Principles; Multimodal Transport: Modal Characteristics; Modal Comparisons; International Air Cargo Transport; Coastal and Ocean transportation, Characteristics of shipping transport- Types of Ships.

Unit 3

Containerization: Genesis, Concept, Classification, Benefits and Constraints; Inland Container Depot (ICD): Roles and Functions, CFS, Export Clearance at ICD; CONCOR; ICDs under CONCOR;

Unit -4

Packing and Packaging: Meaning, Functions and Essentials of Packing and Packaging, Packing for Storage- Overseas ShipmentInland-Transportation- Product content Protection, Packaging Types: Primary, Secondary and Tertiary- Requirements of Consumer Packaging, Channel Member Packaging and Transport Packaging - Shrink packaging –Identification codes, bar codes, and electronic data interchange (EDI)- Universal Product Code- GS1 Standards- package labels- Symbols used on packages and labels.

Unit – 5

Special Aspects of Export logistics: Picking, Packing, Vessel Booking [Less-than Container Load(LCL) / Full Container Load (FCL)], Customs, Documentation, Shipment, Delivery to distribution centers, distributors and lastly the retail outlets- Import Logistics: Documents Collection- Valuing- Bonded WarehousingCustoms Formalities- Clearing ,Distribution to Units.

Text Books:

1.Bowersox, Closs, Cooper, Supply Chain Logistics Management, McGraw Hill.

2. Burt, Dobbler, Starling, World Class Supply Management, TMH.

3. Donald J Bowersox, David J Closs, Logistical Management, TMH

4. Pierre David, "International Logistics", Biztantra.

5. Sunil Chopra, Peter Meindl, Supply Chain Management ,Pearson Education, India.

CORE ELECTIVE
Paper - 4
C. BANKING AND INDIAN FINANCIAL SYSTEMS

Course Objectives:
To enlighten the students with the Concepts & Practical dynamics of the Indian Financial System, Markets, Institution and Financial Services.

Course outcome

- 1.Understand and learn the Indian Banking system.
- 2.Understand and learn the structure of central banking system.
- 3.Student shall be able to learn & understand the Concepts & Practical dynamics of the Indian industrial and agricultural banking systems in India.
- 4.Student shall be able to learn & understand the Concepts & Practical dynamics of the Indian Financial System.
- 5.Understand and learn the foreign investment system.

UNIT 1: BANKING SYSTEMS: Definitions- Functions- Types- Central Banking- Structure of Banking System- Rural Financing- Banker and Customer Relationship- Deposit Mobilization- Loans and Advances- Assets and Liabilities Management- Secured Advances- Endorsement and Crossing of Cheques- Payment of Cheques- Collection of Cheques.

UNIT 2: CENTRAL BANKING SYSTEM: Nature- Organization and Management- Functions- Methods of Credit Controls- Objects of Monetary Policy- Autonomy of Central Bank Systems- Indian Money Market- Indian Capital Market- New Issue Market- Banking Legislations in India.

UNIT 3: INDUSTRIAL AND AGRICULTURAL BANKING SYSTEMS: All Indian Development Banks- Investment Institutions- State Level Institutions- Specialized Financial Institutions- International Finance Institutions- IBRD- IFC- IDA- NABARD-NHB- Micro Financing Institutions.

UNIT 4: FINANCIAL SYSTEMS: Introduction- Overview of Indian Financial System- savings and Financial Intermediation- financial Markets- Listing Regulations- Primary Markets- Secondary Markets- Mutual Funds- Indian Fiscal Systems.

UNIT 5: FOREIGN INVESTMENTS: Foreign Capital- Foreign Collaboration- Foreign Direct Investment- foreign Institutional Investors- Offshore Country Funds- Overseas Venture Capital Investments- International Capital Market

Text books:
1. M.Y. Khan, Indian Financial System, Tata Mc Graw Hill
2. Sundharam and Varshney, Banking and Financial System, Sultan Chand & Sons

References:
1. H.R. Machiraju, Indian Financial System, Vikas Publishing House
2. Varshney, Banking and Financial Systems, S Chand
3. SriVastava, Management of Financial Institutions, Himalaya Publications.

OPEN ELECTIVE
Paper - 4
(to choose one out of 3)

A. STRATEGIC HUMAN RESOURCE MANAGEMENT

Course Objective:
- To distinguish the strategic approach to human resources from the traditional functionalapproach.
- To understand the role strategic human resource management in a firm's success, along with knowledge of the basic functions of human resource management, current
- The course would enable students to gain an understanding of the latest trends and developments in training.

Course Outcome
At the end of the course the students will be able to:
- 1.Identify the key HRM functions and operations;
- 2.Comapre the linkages between HRM functions and operations and organizational strategies, structures and culture;
- 3.Analyze how training helps to improve the employee performance.
- 4.Calculate the Concept of Competency mapping and potential assessment center.
- 5.Exhibit behaviour and performance that demonstrates enhanced competence in decision-making, group leadership, oral and written communication, critical thinking, problem-solving, planning and team work.

UNIT I HUMAN RESOURCE DEVELOPMENT
Meaning – Strategic Framework for HRD – Vision, Mission and Values – Importance – Challenges to Organizations – HRD Functions – Roles of HRD Professionals – HRD Needs Assessment – HRD Practices – Measures of HRD Performance – Strategy and Business Goals – HRD Program Implementation and Evaluation – Recent Trends – Strategic Capability.

UNIT II EVALUATING HRD
Motivational aspects of HRD – Line managers and HRD – Developmental supervisions counseling and mentoring – Bench Marking – Human Resource Accounting – HRD audit.

UNIT III TRAINING AND DEVELOPMENT
Training – Types of training - Formulation and statement of training and development policies – training and developments of managerial personnel – technical personnel and workers – management development methods – Evaluation of training and development programmes –
e-training – Cross culture.

UNIT IV CAREER & COMPETENCY DEVELOPMENT
Career Concepts – Roles – Career stages – Career planning – career development – competencies and career management - Managing Career Plateaus – Designing Effective Career Development Systems – competency mapping model – Equity and Competency based Compensation– succession planning – potential appraisal assessment center.

UNIT V HRD IN ACTION

HRD approaches for coping with major organizational changes and case studies of HRD in Indian organization – current developments, role of HR functions in TQM – employee health and welfare programs work stress – Employee coaching and counseling.

Total: 60 H

Text Books:

Jim Grieves, Strategic Human Resource Development, Sage Publications, 2003.

Srinivas R.Kandula, Strategic Human Resource Development, PHI, 2001.

References:

- Jeffrey A Mello, 'Strategic Human Resource Management', Thomson, Singapore,Southwestern 2003.
- Randy L.Desimone, Jon M. Werner – David M. Marris, 'Human Resource Development', Thomson Southwestern, Singapore, 2002.
- Robert L.Mathis and John H. Jackson, 'Human Resource Management', Thomson Southwestern, Singapore, 2003.
- Rosemary Harrison, 'Employee Development' – University Press, India Ltd, New Delhi, 2003.
- Srinivas Kandula, 'Human Resource Management in Practice', Prentice Hall of India, 2005, New Delhi, 2004.
- Werner &Desimone, Human Resource Development, Cengage Learning, 2006
- William E. Blank, Handbook For Developing Competency Based TrainingProgrammes, Prentice-Hall, New Jersey, 1982.
- Uday Kumar Haldar, Human Resource Development, Oxford University Press, 2009.

OPEN ELECTIVE

Paper - 4

B. BRAND MANAGEMENT

Course objective –
- To understand the importance of products and branding.
- To successfully build brands and creating a emotional attachment to the consumers.

Course outcome
- Formulate the decisions regarding product and brand extensions.
- Discuss the history of successful brands and summarize the several functions of marketing management.
- Compare and contrast the brands of a given product.
- Measure brand equity to know the strength of brand.
- Differentiate branding in various categories of products.

UNIT – I
Concept of a brand – Evolution, perspectives, anatomy, types of brand names, brand name associations, Brands Vs Products, Advantages of Brands to consumers & firms. Brand elements: Components & choosing brand elements, Branding challenges & opportunities.

UNIT – II
Brand positioning – Basic concepts – alternatives – risks – Brands & consumers – Strategies for positioning the brand for competitive advantage – Points of parity – Points of difference - Buying decision perspectives on consumer behaviour, Building a strong brand – Method & implications.

UNIT – III
Brand Image, image dimensions, brand associations & image, Brand identity – perspectives, levels, and prisms. Managing Brand image – stages – functional, symbolic & experiential brands. Brand Equity – Sources of Equity. Brand Equity models, Brand audits. Brand Loyalty & cult brands.

UNIT – IV
Leveraging Brands – Brand extensions, extendibility, merits & demerits, Line extensions, line trap – Co-branding & Licensing Brands. Reinforcing and Revitalisation of Brands – need, methods, Brand Architecture – product, line, range, umbrella & source endorsed brands. Brand Portfolio Management.

UNIT – V
Brand valuation – Methods of valuation, implications for buying & selling brands. Applications – Branding industrial products, services and Retailers – Building Brands online. Indianisation of Foreign brands & taking Indian brands global – issues & challenges.

Reference:

1. Kevin Lane Keller, Strategic Brand Management, PHI/Pearson, New Delhi.
2. Kapferer, Strategic Brand Management, Kogan Page, New Delhi.
3. Harsh Varma, Brand Management, Excell Books, New Delhi.
4. Majumdar, Product Management in India, PHI.
5. Sengupta, Brand Positioning, Tata McGraw Hill.
6. Rameshkumar, Managing Indian Brands, Vikas.
7. Chandrasekar, Product Management, Himalaya.

C. WORKING CAPITAL MANAGEMENT

Course Objective

- Evaluate comparative working capital management policies and their impact on the firm's profitability, liquidity, risk and operating flexibility.
- Evaluate the importance of effective working capital management and its role in meeting the firm's strategic objectives and its impact in value creation.
- Investigate funds flow cycles and their impact on working capital management objectives.

Course Outcome

- Compare and contrast the relative merits of alternative working capital policies and the likely short-term and long-term impact on the firm.
- Formulate appropriate working capital management policies to achieve corporate objectives.
- Apply corporate cash management, accounts receivable management, bank relations, and inventory management techniques to maximize the share holders' value.
- Write a plan for a balanced integration of cash, credit and other short-term topics and policies.
- Formulate and integrate an extended treatment on international working capital topics.

UNIT-I

Management of working capital: Meaning of working of capital - Need for working capital - Types of working capital - Determinants of working capital - Permanent and Variable working capital assets - Trade off between capital different approaches - Matching approaches - Conservative approach - Aggressive approach

UNIT-II

Accounts receivables management: objective - Formulation of credit and collection policies - Designing of credit terms - Discount, the discount period and the credit period - collection policies and procedures - Cost benefits analysis - Trade off - Evaluation of existing and proposed policies.

UNIT-III

Inventory management: Objective of Inventory - Need for Inventories and the importance of its Management - Determination of optimum level of inventory - Types of Inventory - Inventory Models - Order Quantity - E.O.Q. Model - Order point - Safety Stock - Analysis of investment in inventory - ABC Analysis.

UNIT-IV

Management of Cash Marketable Securities: Meaning of cash - Motives for holding cash - Need for holding cash - Operating cycle - Objective of Cash management - Marketable securities - Cash cycle - Cash turnover - Minimum Operating cash - Cash release by operations in Inventory turnover - Accounts receivable and Accounts payables - Assumptions - Benefits Cash management Strategies and Techniques - Concentration banking and Lock Box System - Advantages.

UNIT-V

Integrating Working Capital and Capital investment processes: Monetary system; Money market in India; Banking system in India - Review of the system of cash credit - Establishment of Discount & Finance House of India. Working Capital Management and Bank financing - Forms of bank finance - Working capital control and banking policy - Dehejia study group - Chore committee - Tandon committee - Findings and Recommendations - Regulation of the bank credit.

Text Books

1. Bhalla, V.K: Working Capital Management: Text and Cases, New Delhi, Anmol Pub
(P) Ltd., 4th ed., 2001.

2. Rao P.M. Pramanik A.K.: Working Capital Management; New Delhi, Deep & Deep Publication, 2004.
3. Scherr F.C: Modern Working Capital Management, New Delhi, Prentice Hall of India, 1995.

Reference Books

1. Hampton J.J & C.L. Wagner: Working Capital Management, New Delhi, John Willey & Sons, 1996.

2. Rao P.M.: Financial Management: New Methods and Practices, New Delhi, Deep & Deep Publications (P) Ltd., 2003.

3. Subhash Sharmam, M. Panduranga vithal: Financial Accounting for Management; Text and Cases; New Delhi, Macmillan India Ltd., 2001.

List of NPTEL Courses under MOOC's recommended:

1. Global Marketing Management
2. Sales and Distribution Management
3. Behavioral and Personal Finance
4. Business Analytics for Management Decisions
5. Consumer Behaviour
6. Entrepreneurship
7. Business Ethics
8. Total Quality Management
9. Corporate Social Responsibility
10. Financial Institution and Markets

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MUTHURANGAM GOVT.ARTS COLLEGE (AUTONOMOUS),VELLORE
B SC NUTRITION FOOD SERVICE MANAGEMENT AND DIETETICS
(CBCS PATTERN) [WITH EFFECT FROM 2017 0nwards]
The course of study and the scheme of Examination

Year/Sem	Part	Subject	Paper	Subject Title	Hours /Week	Credit	Exam Hrs	IA	ESE	Total
I	I	Language	I	Foundation Tamil I	6	3	3	25	75	100
	II	English	I	Foundation English I	6	3	3	25	75	100
	III	Core	I	Human Physiology	6	6	3	25	75	100
	III	Core Practical	I	Human Physiology and Food Microbiology Practical	3	-	-	-	-	-
	III	Allied I	I	Chemistry	4	4	3	25	75	100
	III	Allied Practical	I	Chemistry practical	3	-	-	-	-	-
	IV			Environmental Studies	2	2	3	25	75	100
				Total	**30**	**18**				**500**
II	I	Language	II	Foundation Tamil II	6	3	3	25	75	100
	II	English	II	Foundation English II	6	3	3	25	75	100
	III	Core	II	Food Microbiology	6	6	3	25	75	100
	III	Core practical	I	Human Physiology and Food Microbiology Practical	3	3	3	40	60	100

	III	Allied II	II	Chemistry	4	4	3	25	75	100
	III	Allied Practical	II	Chemistry practical	3	2	3	40	60	100
	IV			Value Education General Awareness	2	2	3	25	75	100
				Total	**30**	**23**				**700**
III	I	Language	III	Foundation Tamil III	6	3	3	25	75	100
	II	English	III	Foundation English III	6	3	3	25	75	100
	III	Core	III	Food Science	3	3	3	25	75	100
	III	Core Practical	II	Food Science And Advanced Cookery Practical	3	-	-	-	-	-
	III	Allied III	III	Food Standards and Quality control	4	4	3	25	75	100
	III	Allied Practical III	III	Food Standards and Quality Control &Child development Practical	3	-	-	-	-	-
	IV	Skill Based Subject I	I	Food Preservation	3	3	3	25	75	100
		Non Major Elective	I	Basic Nutrition	2	2	3	25	75	100
				Total	**30**	**18**				**600**
IV	I	Language	IV	Foundation Tamil IV	6	3	3	25	75	100
	II	English	IV	Foundation English IV	6	3	3	25	75	100

	III	Core	IV	Advanced Cookery	4	4	3	25	75	100
	III	Core Practical	II	Food Science and Advanced Cookery Practical	3	3	3	40	60	100
	III	Allied IV	IV	Child Development and Counselling	4	4	3	25	75	100
	III	Allied Practical III	III	Food Standards & Quality Control and Child Development practical	2	2	3	40	60	100
	IV	Skill Based Subject II	II	Entrepreneurship Development	3	3	3	25	75	100
		Non Major Elective	II	Basic Dietetics	2	2	3	25	75	100
				Total	**30**	**24**				**800**
V	III	Core	V	Human Nutrition	5	4	3	25	75	100
	III	Core	VI	Dietetics-I	4	3	3	25	75	100
		Core	VII	Nutrition Through Life cycle	4	3	3	25	75	100
	III	Core Practical	III	Human Nutrition practical	3	3	3	40	60	100
		Core practical	IV	Dietetics I and NTLC Practical	6	6	3	40	60	100
		Elective I	I	Nutritional Biochemistry	5	5	3	25	75	100
		Skill Based Subject	III	Interior Decoration	3	3	3	25	75	100

				Total	**30**	**27**				**700**
VI	IV	Core	VIII	Dietetics-II	4	4	3	25	75	100
		Core	IX	Food Service Management	4	3	3	25	75	100
		Core Practical	V	Dietetics II Practical	6	5	3	40	60	100
		Core Practical	VI	Food Service Management Practical	3	3	3	40	60	100
		Elective	II	Community Nutrition	5	5	3	25	75	100
		Elective	III	Food Biotechnology	5	5	3	25	75	100
		Skill Based Subject	IV	Health and Fitness	3	3	3	25	75	100
				Extension		I				
				Soft Skill		1				
				Total	**30**	**30**				**700**
				Grand Total		**140**				**4000**

Muthurangam Government Arts College, Vellore- 632 002.
Department Nutrition, Food service Management and Dietetics

SEMESTER – I

CORE PAPER- I

HUMAN PHYSIOLOGY

Objectives:

1. To enable the students to understand the structure and basic physiology of various organs of the body.

2. To obtain better understanding of the principles of Nutrition through the study of physiology.

UNIT-I: CELL-TISSUES

Introduction to the cell – Structure and function of a typical cell, cell division – Mitosis and Meiosis.

Tissues - classification, structure and function of epithelial, muscular, connective and nervous tissues.

UNIT-II: BLOOD, AND CIRCULATORY SYSTEM

Blood: Blood composition and function - plasma proteins, distribution functions. Cell components - RBC - Structure, function, normal count; WBC - classification, function, normal values. Blood coagulation, Erythropoiesis, Blood grouping. ABO system and RH system

Heart and circulation: Structure of the heart and blood vessels, origin and conduction of heart beat, cardiac cycle, ECG, blood pressure – definition and factors affecting it.

UNIT-III: RESPIRATORY AND EXCRETORY SYSTEM

Respiratory system: Structure of pharynx, larynx, trachea, bronchi, lung and lung cavities. Physiology of respiration- Mechanism of respiration, gaseous exchange in the lungs.

Excretory system: Structure and function of kidney and Nephron, urine formation, micturition.

UNIT-IV: DIGESTIVE SYSTEM & NERVOUS SYSTEM

Digestive system-Structure and function – Secretory Digestive and absorptive functions. Role of Liver, Pancreas and Gall bladder.

Neuron structure and functions, Structure of Brain and Spinal cord

Autonomic nervous system – sympathetic and parasympathetic.

UNIT-V: ENDOCRINE AND REPRODUCTIVE SYSTEM

Structure, Functions and Disorders of Endocrine Glands – Pituitary, Thyroid, Parathyroid, Adrenal and Islets of Langerhans.

General structure of male and female reproductive organs, menstrual cycle, menarche and Menopause.

REFERENCES: HUMAN PHYSIOLOGY

1. Best, C.H & Taylor, N.B. The Living Body, Asia publishing House, B. Mumbai, 1964. Meyer B J,

2. Chatterjee C.C., Human Physiology, Vol. I & II, Medical Allied Agency, Calcutta, 1988.

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5. Jain, A.K., Textbook of Physiology, Vol. I and II, Avichal Publishing Co., New Delhi.

6. Langley, L.L. Cell functions, East West Press Ltd, New Delhi, 1968.

7. Meij H S and Meyer A C., Human Physiology, AITBS Publishers and Distributors.

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11. Vidhya Rathan, Handbook of Human physiology, Jaypee Brothers, New Delhi, 1986.

12. Wilson, K.J.W and Waugh, A., Ross and Wilson, Anatomy and Physiology in Health and Illness, 8th Edition, Churchill Livingstone.2003.

13. Wright, Applied Physiology, Oxford University Press,   Madras, 1966.

SEMESTER – II

CORE PAPER- II

FOOD MICROBIOLOGY

Objectives:

To enable the students to:

1. Gain knowledge of the role of micro-organisms in health and disease.
2. To understand the role of micro-organisms in spoilage of various foods.
3. To gain knowledge of micro-organisms in relation to food and food preservation.

UNIT-I:

Introduction of Microbiology and its relevance to everyday life.

General Characteristics of Bacteria, Viruses, Yeast, Molds, Protozoa, Algae.

    a. Bacteria: Bacterial cell, Morphology, Reproduction and Economic importance.

    b. Viruses: Morphology, Classification, and Economic importance.

    c. Yeast: Morphology - Cell structure, Reproduction and Economic importance.

    d. Molds: Morphology, Classification, Reproduction and Economic importance.

    e. Algae: Morphology - Structure and Reproduction.

    f. Protozoa: Morphology, Reproduction, Motility and Classification.

UNIT-II : CONTAMINATION AND SPOILAGE OF FOODS

Principles of food spoilage by microbiological, physical and biological factors - Causes of spoilage – Classification of foods based on spoilage – factors affecting – kinds and numbers of micro-organism in food; Growth and chemical changes caused by microorganisms.

Contamination, preservation and spoilage of cereal and cereal products, baked products, Fruits and vegetables and their products, Fleshy food, Milk and Milk products, Egg and Egg Products, and Fats and oils.

UNIT-III : MICROBIOLOGY OF FOOD POISONING, FOOD INFECTIONS AND FOOD BORNE DISEASES

Microbial food poisoning by Staphylococci, Salmonella and clostridium botulinum (Botulism). Measures to prevent microbial food poisoning.

Food infections - Food borne diseases - Dysentery diarrhea, Typhoid, Cholera.

UNIT- IV: MICRO ORGANISM IN HUMAN WELFARE

Importance of microbes in food biotechnology, genetically engineered organisms, probiotics and single cell proteins.

Fermentation: Aerobic and Anaerobic respiration. Products of Fermentation- Brief knowledge on the preparation of Bread, Malt beverages, Wine, Distil liquor, Vinegar, Fermented Vegetables and Dairy products.

UNIT-V : PRINCIPLES OF FOOD PRESERVATION

Use of high and low temperature. Preservation by drying, Use of chemicals in food preservation. Role of antibiotics

DESTRUCTION OF MICRO-ORGANISM

Sterilization:
- (i)   Application of Dry heat, burning, flaming and hot air oven.
- (ii)   Application of moist heat, boiling, pasteurization, steam sterilizers and autoclave
- (iii)   Sterilization with the use of filters.

Pasteurization:
- (i)   Advantages involved in pasteurization, methods – holder, flash.

REFERENCES : FOOD MICROBIOLOGY

1. ADAMS M.R. and MOSS M.O; Food microbiology, the Royal society and chemistry. Cambridge 1991.

2. Ananthanarayan. R. & Paniker C.K.J; Textbook of Microbiology.

3. Banwart. G.J (1989), Basic food microbiology, 2nd Edition, CBS Publishers.

4. Carpenter, Microbiology - W.B. Saunders Co., London.

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8. R.C.Rubey & D.K. Maheshwari; A Textbook of Microbiology

9. West Wood and Harger; Food Service in Institutions, 1966. John Wiley and Sons. Incorporation, New York , London.

SEMESTER – II

CORE PRACTICAL -I

HUMAN PHYSIOLOGY AND FOOD MICROBIOLOGY

OBJECTIVES:

1. To understand the practical knowledge on Human physiology and microbiology
2. To acquaint the students with basic principles of home nursing.

A. Human Physiology:

1. Microscopic study of different tissues – epithelial, connective, muscular and nervous tissue.

2. Microscopic structure of bone, cartilage.

3. Microscopic structure of artery, vein, nerves.

4. Microscopic structure of the reproductive organs and endocrine glands – ovary, uterus, mammary glands, testis, thyroid, pituitary, adrenal.

5. Study of anatomy of heart, brain, kidney and digestive system using readymade models.

5. Estimation of hemoglobin and blood groups

6. Bleeding time, clotting time.

7. Method of estimating pulse rate and blood pressure

B. Food Microbiology:

1. Microscope and its use.

2. Examination of Yeast, molds, Protozoa and Bacteria.

3. Examination of wet methods and hanging drop preparations.

4. Examination of stained organisms, Simple Staining and gram method of staining.

5. Study of Sterilizing Equipment

SEMESTER – III
CORE PAPER- III
FOOD SCIENCE

OBJECTIVES:

To enable students:

1. Obtain knowledge of different food groups and their nutritive value.

2. Understand the scientific principles underlying cooking.

3. Develop skill and techniques in food preparation with conservation of nutrients and palatability using various cooking methods.

UNIT-I:

Definition, classification, Functions of foods- in relation to health – Classification of foods based on nutrients. Need for grouping foods ,application of food groups in planning adequate diets food pyramid, food groups– Basic four, Basic five, Basic seven, Basic nine

UNIT - II:

Preliminary preparation of foods prior to cooking with special reference to conservation of nutrients and palatability, different methods of cooking on acceptability and nutritive value of foods. Dry methods – frying, broiling, parching and baking. Moist methods- boiling, stewing, cooking under pressure. Micro- wave cooking- advantages and disadvantages.

UNIT-III:

Cereal and cereal products- microscopic structure of wheat- Nutritive value of rice, wheat and locally available millets. Effect of cooking on the nutritive value of cereals. Gelatinization, dextrinization, gluten formation.

Pulses and nuts- Nutritive value- methods of minimize the loss nutrients, colour, texture, flavour. Browning reaction- changes during cooking. Points/factors, to be considered while cooking legumes, Role of anti-nutritional factors in pulses, textured vegetable protein (TVP).

UNIT-IV:

Milk and Milk Products- Nutritive value, principles of milk cookery, milk protein, coagulation, Processing of milk and problems in milk cookery.

Meat- Nutritive value, post mortem changes in meat, factors affecting tenderness. and methods of cooking.

Fish- nutritive value- selection, methods of cooking

Poultry – nutritive value, principles and methods of cooking poultry.

Egg- structure, nutritive value, selection- principles of egg cookery- uses of eggs in cookery, methods of cooking eggs.

Vegetables and fruits- classification, composition, Nutritive value. Methods to minimize the loss of nutrients, types of pigments, effects of acid on colour ,texture, flavour. Browning reaction and changes during cooking.

UNIT-V:

Fats and oils- uses of fat in cookery- factors affecting absorption of fats- smoking point-rancidity.
Sugar and sugar products- uses in Indian cookery- stages in sugar.
Spices and condiments- uses in Indian cookery.
Beverages- Classification, nutritive value and uses-coffee, tea, cocoa.

REFERENCES : FOOD SCIENCE

1. Bennion, M.and Hughes, D. Introductory foods Macmillan Publishing Co. Inc. New York. 1975.

2. Brich C.G. Spencer M and Cancerron, A.G Food Science, Pergamon Press, New York, 1977.

3. Groworld.R.H, The experimental study of foods. Houghton Mifflin Co, Boston, 1972.

4. Mudambi.S.R.Rao, S.M. Food Science, Wiley Eastern Ltd., New Delhi, 1986.

5. Norman.Npotter, joseph H.Hotchkiss, food science, fifth edition, CBS publishers,2012`

6. Sivashankar .B, food processing and preservation , PHI learning private ltd ,2011

7. Srilakshmi.B, food science ,6thedition,new age international publishers pvt ltd,2015

8. Swaminathan. M , Food Science and Experimental foods. Ganesh and Co, Madras, 1979.

SEMESTER-III

ALLIED PAPER-III

FOOD STANDARD AND QUALITY CONTROL

OBJECTIVES:

1. To enable students to gain knowledge on food safety and food laws.

2. To study about food quality control and common food standards.

UNIT-I: FOOD QUALITY CONTROL

Objectives, Principles, Importance, Functions of quality control, Total Quality Management [TQM] – Elements of TQM, Need for TQM and Implementation of TQM in food industries.

UNIT-II: FOOD LAWS AND GOVERNMENT REGULATIONS

FOOD LAWS - PFA, Essential commodities Act, FPO, MFPO, ISI, BIS, FSSAI, Agmark, **International Standards** - FAO, WHO, Codex Alimentarious , ISO 22000 series, Hazard Analysis Critical Control Point [HACCP]- objectives and functions.

UNIT-III:

FOOD SAFETY: Meaning, importance of food quality and safety for developing countries, Factors affecting food safety regulations.

FOOD HAZARDS: Physical, Chemical, Biological Hazard associated with different food types.

FOOD PACKAGING: Various methods of food packaging and labeling, recent trends in packaging and labeling, packaging hazards associated with different types of foods.

UNIT-IV: FOOD ADULTERATION

Definition, Types of adulterants, Common adulterants in different foods, Methods of detecting adulterated foods.

UNIT-V: CONSUMERISM

Definition, consumer protection, consumer education, Missionary for redresses of consumer grievances, rights and responsibilities of consumers.

REFERENCES: FOOD STANDARD AND QUALITY CONTROL

1. Amihud Kramer and Bernard A – Twigg, Quality control for the food industry, AVI publishing and co, Connecticut.

2. Desrosier and Desrosier, Technology of food preservation – CBS Publishers, Fourth edition, 1999.

3. Gaurth Hansen, Bontia. W.Wyse and Ann.W, Sorrenson, Nutritional Quality Control, AVI Pubishing and Co, Connecticut.

4. Herschdoerfer, S.M, Quality control in the food industry, Vol.I, Academic press, 1984.

5. Kumar N., consumer protection in India, Himalya publishing House, New Delhi, 1999.

6. Manoranjan Kalia, Food Analysis and Quality, Kalyani publishers, New Delhi, 2002.

7. Norman. N. Potter and Joseph. H.Hotchkiss, Food Science- CBS Publishers, 1996.

8. Ranganna, S. Manual of fruits and vegetable products, MC.Graw Hill International publishers, New Delhi, 1986.

9. Sathe. A.Y A First course in food analysis – New Age Publications, 1999.

10. Sherlekar S.A., Trade practices and consumerism, Himalaya publishing House, New Delhi, 1984.
11. Srilakshmi. B, 2002, Food Science, New Age International Publishers.

12. Swaminathan. M - Hand Book of Food Science and Experimental Foods, BAPCO, 88 Mysore Road, Bangalore.

SEMESTER-III

SKILL BASED SUBJECT – I

FOOD PRESERVATION

OBJECTIVES:

1. To understand the principles of preservation and develop skills to preserve foods and prevent wastes.
2. To study about both traditional and recent advancements in food preservation.
3. To know the importance of sanitation and hygiene in food preservation.

UNIT - I: BASICS OF FOOD PRESERVATION

Food Preservation - Importance and principles. Food spoilage– definition, types and preventive methods. Importance of sanitation and hygiene in food preservation.

UNIT – II: PRESERVATION BY HIGH OSMOTIC PRESSURE

High concentration of sugar – jam, jelly, marmalade, crystallized or glazed fruits. Procedure for jam and jelly, factors affecting their formation and failure to set.

High concentration of salt – pickling and curing of meat.

UNIT - III:

PRESERVATION BY USE OF HEAT

Canning - Principle, aseptic canning process, spoilage of canned foods.

Pasteurization - Principle, types and advantages.

PRESERVATION BY LOW TEMPERATURE

Refrigeration - Principle, factors to be considered, cold storage defects.

Freezing - Principle, types, methods, advantages and disadvantages.

UNIT - IV: PRESERVATION BY DRYING AND DEHYDRATION

Principles, methods, pre-treatment and factors affecting drying and dehydration. Intermediate Moisture Foods (IMF) – Merits and Demerits.

UNIT – V: PRESERVATION BY USE OF CHEMICALS

Mechanism of microbial inhibition, Inorganic and organic preservatives, use of antibodies and antioxidants in preservation.

PRESERVATION BY RADIATION

Principle, mode of action, permitted doses, advantages and safety of irradiated foods.

REFERENCES: FOOD PRESERVATION

1. Manoranjan kalia., professor, Dept. of Food Science and Nutrition, Himachal Pradesh Agricultural University, Palampur, Himachal Pradesh.

2. Nowman N. Potter., Professor Food Technology, Cornell University, Ithaca, New York.

3. "Principles of Food Science- Part-II": Physical Method of Food Preservation by M.karel, O.R. Fennema and D.B.Lund, Marcel Dekkar Inc.

4. "Principles of Food Preservation" by V. Kyzlink, Elsevier Press.

5. Walter A. Mercer., Vice – President, Western Research Laboratory and National Canners Association, Berkeley, California.

SEMESTER – III
NON – MAJOR ELECTIVE- I
PAPER – I
BASIC NUTRITION

OBJECTIVES:

1. To understand the sources and functions of nutrients.

2. To apply the knowledge in maintenance of good health for individual and family.

UNIT – I: INTRODUCTION TO NUTRITION SCIENCE

Definition- Food, Nutrition and Health, Interrelationship between food, Nutrition and Health, Malnutrition-Determinants and Consequences.

UNIT-II: CARBOHYDRATES

Classification, Functions and Food sources. Importance of dietary fiber.

UNIT-III: PROTEINS

Classification, Functions, Food sources, effect of deficiency.

UNIT-IV: LIPID

Classification, Functions, Food sources, effect of deficiency.

UNIT-V:

A) **VITAMINS AND MINERALS:** An overview of classification, Functions, Food sources and effects of deficiency.

B) **WATER:** Functions, causes and effects of dehydration, prevention of dehydration.

REFERENCES: BASIC NUTRITION

1. Antia.F.P and Philip Abraham, 2002, "Clinical Dietetics and Nutrition, Oxford University Press.

2. Srilakshmi.B, 2002, Nutrition Science, New Age International Publishers.

3. Swaminathan.M, 1978, Hand book of Food and Nutrition, The Bangalore printing and publishing co., LTD

SEMESTER- IV

CORE PAPER – IV

ADVANCED COOKERY

OBJECTIVES:

To enable the students to

1. Study different methods of cooking foods and gain experience in food preparations, sensory evaluation of foods.

2. To supervise kitchen management.

UNIT-I: INTRODUCTION TO COOKERY

Aim and objectives of cooking food, Basic culinary terms, new developments in cooking. Methods of increasing the nutritive value of foods while cooking, sprouting / germination, fermentation, parboiling, combination of foods, supplementation and substitution. Development of recipes for different methods of cooking.

UNIT-II: SENSORY EVALUATION

Factors affecting acceptance, sensory characteristics of food. Criteria involved in the selection of panel members, sample preparation and presentation, score cards. Different methods [test] of sensory evaluation.

UNIT-III: MENU PLANNING

Origin of Menu, Importance of menu planning. Types of menus – Table d'hote menu, a la carte menu, French classical menu. Use of menus, construction of menus. Factors affecting menu planning,

Standardization of recipes, portion control, use of left overs.

UNIT-IV: CUISINE SPECIALTIES

Accompaniments, garnishes, stocks, sauces, Soups, stuffing's flavorings and seasonings, salad and salad dressings, beverages and sandwiches.

Regional Indian Cookery – Kashmiri Cuisine, Punjabi Cuisine, Bengali Cuisine, Awadh Cuisine, Maharashtrian Cuisine, Andhra Cuisine, Kerala Cuisine, Tamil Nadu Cuisine, Mangalorean Cuisine, Goa Cuisine.

UNIT-V: INTERNATIONAL CUISINES

Introduction to influences of cultures on regions, special features with respect to cooking methods in the following countries- Caribbean, china, India, Indonesia, Mexico, Thailand, Middle East.

REFERENCES: ADVANCED COOKERY

1. kimiko ''A Book of Cookery'',2017 ,cook publishers and printers.

2. Mathew S [2001] Practical Manual of introductory foods, Agrobios India, Jodhpur

3. Monisha ,2016 "The Indian Cookery",oxford publishers and printers.

4. MohiniSethi and Eram S Rao [2001] Food Science – Experiments and Applications, CBS Publishers, New Delhi.

5. Phily, T.E. Modern Cookery for Teading and the Trade Vol.I and II orient Longman Ltd.,

6. Srilakshmi B [2003] Food Science – Laboratory manual, Scitech Pub Ltd, Chennai.

7. Usha Chandrasekaran [2012] Food Science and its application to Indian Cookery, Phoenix Pub, New Delhi.

8. West B.B. Wood, L., V.F. and Shugari, G. Food Service in Institutions, John Wiley & Sons Inc. 1979.

SEMESTER- IV
CORE PRACTICAL – II

FOOD SCIENCE AND ADVANCED COOKERY PRACTICAL

EXPERIMENTAL FOODS PRACTICAL

1.**Cereals** –Microscopic study of different starches.

> Methods of combining starch and boiling water.
> Study of effects of moist heat on starch.
> Preparation of white sauces and soups.
> Gluten formation.

2. **Pulses** – Effect of hard and soft water, alkali, cooking time of grams and dhals.

3. **Vegetables** – Effect of acids, alkali, covering, steaming and pressure cooking on the different pigments and acceptability of vegetables.

4. **Fruits** – Study of different methods of preventing enzymatic browning of cut fruits, pectin content of fruits.

5. **Eggs** – Coagulation of egg protein - factors. Egg white foam- effect of beating, sugar, acid and temperature.

6. **Milk cookery** – Coagulation of milk protein, paneer, cooking of vegetables in milk.

7**. Sugar and jaggery** – different stages of crystallization of sugar.

8. General visit to food industry and factories.

ADVANCED COOKERY PRACTICAL

1. Development of recipes for different methods of cooking.

2. Standardization of selected recipes for quantity food project

3. Preparation of score card for sensory evaluation of recipes.

4. Effective use of leftovers.

5. Preparation of salads, sandwiches, stocks, stuffing's and beverages

6. Preparation of menus for international cuisines.

7. Plate presentation with appropriate garnishes and accompaniments.

SEMESTER- IV
ALLIED PAPER - IV

CHILD DEVELOPMENT AND COUNSELING

OBJECTIVES:

To enable the students to

1. Provide necessary theoretical background to the field of child development.

2. Acquaint them about the needs of guidance and counselling at various stages of development.

3. To equip the students with necessary skills required for their prospective jobs as child counselors in pediatric departments, school counselor and family welfare organization.

UNIT-I:

a) Growth and development – Concept , principles, growth trends.
b) Prenatal development –Conception, pregnancy- signs and symptoms, teenage pregnancy, issues related to pregnancy.
c) Prenatal and postnatal care, Management of normal pregnancy-diet, medical supervision and hygiene.

UNIT-II:

a. Parturition, Adjustment of new born to temperature, breathing, feeding and elimination.

b. Infancy – Physical , Motor, Social, Emotional, Cognitive and language development, Minor ailments, Care of infants, feeding, Toilet training, Bathing, Clothing, Sleeping and immunization, importance of mothering .

UNIT-III:

a. Early childhood (2-6yrs) –growth and developments, creativity, importance of play, preschool education.

b. Late child hood (6-12yrs) – growth and developments, play interest and activity.

C. Adolescence (12-18yrs) – growth and developments, relationship with parents and others, problems of youth- personal adjustment, mal adjustment, delinquency, drug addiction and alcoholism.

UNIT-IV:

Meaning and scope of guidance and counseling . Principles of guidance and counseling to the adolescents, school and community . Role of counselor, qualification and qualities of a counselor .

Counseling: principles and process, role of test- diagnostic method, interview, case study, psychological, situation and observation, techniques of counseling- direct and indirect,

UNIT-V:

Adolescent and family counseling, premarital and marital counseling. Behavior problems of children and guidance and counseling .

REFERENCES: CHILD DEVELOPMENT AND COUNSELING

1. Arya Subash, C. Infant and child care of the Indian Mother, Vikas Publishing Co., Delhi, 1970.

2. Berk.L.E (2007), Development through the life span, Pearson Educational Pvt Ltd, New Delhi.

3. Briyastava.K.K (2003), Principles of Guidance and Counselling, Kanishka Publishers and Distributors, New Delhi.

4. Devadas, R.P., and Jaya .N (2002). Textbook on child development, Macmillan India Ltd., Chennai.

5. Jones.R.N (2008), Basic Counselling Skills-A Helpers Manual, 2nd Edition, Sage Publications, New Delhi

6. Dr. Sushma Gupta. Textbook of Nutrition, Child care and psychology, kalyani publisher, New Delhi.

7. Dr. S.V. Kal. Child psychology and child guidance, Himalaya publishing House, Bombay.

8. Dr.Vatsyayan., Child psychology and child guidance, Kedar Nath Ram Nath, Meerut ,Delhi.

 9. Hurlock, E.B. Child development, MC Graw Hill, New York, New Delhi, 1973.

10. Suriakanthi. A (2005), Child Development, Kavitha Publications, Gandhigram, Tamilnadu.

SEMESTER –IV

ALLIED PRACTICAL PAPER-III

FOOD STANDARDS AND QUALITY CONTROL & CHILD DEVELOPMENT AND COUNSELING PRACTICAL

FOOD STANDARDS AND QUALITY CONTROL PRACTICAL

1. Methods of detecting food adulteration in different food.
2. Evaluation of physical, chemical and biological hazards of food

CHILD DEVELOPMENT AND COUNSELLING PRACTICAL

1. Preparation of resource album

2. Overall observation of

    a) Physical set up of preschool
    b) Equipment
    c) Pupil - teacher ratio
    d) Daily program schedule of preschool

3. Observation of pre-school children
    a) Physical and motor development
    b) Emotional development
    c) Social development
    d) Intellectual development
    e) Having experience in planning and carrying out play activities, Science experience, rhymes, storytelling and toy making.

4. Observation of child and adolescent counselling in and submitting report.

SEMESTER- IV

SKILL BASED SUBJECT – II

ENTREPRENEURSHIP DEVELOPMENT

OBJECTIVES:

To enable the students to

1. Learn the qualities of an entrepreneur
2. Understand the process and procedures of setting up of an enterprise.
3. Develop managerial skill for entrepreneur.

UNIT- I: ENTREPRENEURSHIP

Definition – Types, Qualities of an entrepreneur – Classification of an entrepreneur– Factors influencing entrepreneurship – Functions of an entrepreneurs.

ENTERPRISE: Types of an enterprise, Steps for starting an enterprise, Types of an organization, Private and Public ltd, Barriers in starting and enterprise.

UNIT - II: MARKETING

Meaning, Function and Classification, Difference between selling and marketing; Sales management, Sales Promotion, Prizing of product.

UNIT - III: PROJECT REPORT

Meaning, Significance of project report, Elements of project formulation, Planning commission guidelines for project formulation, Slash Preparation.

UNIT - IV: FINANCIAL MANAGEMENT

Book keeping, Break even analysis, Working capital, Cost concept, Financial ratio and their significance, Financial statements and Fund analysis, Financial institution, Financial incentives, Online banking.

TAX: Meaning, Brief knowledge on Direct and Indirect taxation. GST- Meaning, features, Taxes subsumed under GST, GST Act 2016.

UNIT- V: PERSONNEL MANAGEMENT

Principles of techniques of managing employees in an enterprise performance appraisal.

FOOD INDUSTRY: Recent development of entrepreneurs in the food industry.

REFERENCES: ENTREPRENEURSHIP DEVELOPMENT

1. Anil Kumar, S., ET.al., Entrepreneurship Development, New Age International publishers, New Delhi, 2011.

2. Arya Kumar, Entrepreneurship, Pearson, Delhi, 2012.

3. Deshwang PND – Small scale industries concept; growth & management.

4. Gilbit A & Churchill JR; Marketing research methodology hinisadiat.

5. Gupta & Sourivasan; Entrepreneurship development.

6. Holt; "Entrepreneurship".

7. Kanishka Bedi, Management and Entrepreneurship, Oxford University Press, Delhi, 2009.

8. Michael H.Morris, ET.al., Entrepreneurship and Innovation , Cengage Learning, New Delhi, 2011.

9. Paranjeep; women Entrepreneurship problem & prospects.

10. Planning guide – How to launch a successful enterprise.

11. Poornima M.CH., Entrepreneurship Development- small business enterprises, pearson, Delhi, 2009.

12. Roa tv; Pareek nee developing entrepreneurship – Hand book.

13. Sahay.A, M.S.Chhikara, New Vistas of Entrepreneurship: Challenges & Opportunities.

14. Welsh & Jerry – Entrepreneurship master.

SEMESTER- IV
NON- MAJOR ELECTIVE – II
BASIC DIETETICS

OBJECTIVES:

To enable the students to

1. Gain knowledge on the therapeutic diets for various diseases condition.
2. Understand the diet planning and diet counseling.

UNIT- I: MEAL PLANNING

Basic principles of menu planning , factors influencing meal planning, concept, purpose and principles of therapeutic diets.

UNIT –II: DIABETES MELLITUS

Classification, etiology, symptoms and dietary management .

UNIT- III: CARDIO VASCULAR DISEASES

Etiology, symptoms and dietary management .

UNIT- IV: KIDNEY DISORDERS:

Etiology, symptoms and dietary management.

UNIT- V: CANCER

Etiology, symptoms and dietary management.

REFERENCES:- BASIC DIETETICS

1. Davidson & Passmore R & Brock J.B Human Nutrition &Dietetics, 1976. The English Languages Bood Society & Chruchill Living Stone.
2. David, M.Paize et al. Clinical Nutrition, 1988 C.V. Moshy Co. St. Louis.
3. Srilakshmi.B,2010,Dietetics, New Age International Publishers.
4. Sue Rodwell Williams Nutrition and Diet therapy 1985. The C.V.Mosby Saint Louis.
5. Swaminathan.M, Essential of Nutrition Vol I & II 1974. The Ganesh and company, Madras.

SEMESTER- V
CORE PAPER –V
HUMAN NUTRITION

OBJECTIVES:

1. To study the role of nutrients in human health and well being.

 2. To understand the physiological and metabolic role of nutrients.

 3. To understand nutritional deficiency and toxicity.

UNIT - I:

NUTRITION - Definition, History of nutrition as a science, nutritional status.

CARBOHYDRATES – Food sources, classification, biological functions, requirements, digestion, absorption and utilization. Glycemic index of foods and its relationship to blood glucose level.

FIBRE – Food sources, classification, role of fibre in human nutrition and in preventing diseases, limitations in excess consumption of fibre.

UNIT - II:

LIPIDS – Food sources, classification, biological functions, requirements, digestion, absorption, and transport. EFA – definition and functions, role of n-3 and n-6 fatty acids in health and disease. Trans fatty acids and its association to heart health.

PROTEINS – Food sources, nutritional classification, biological functions, requirements, digestion, absorption, utilization. Evaluation of protein quality by nitrogen balance methods – biological value of proteins, digestability co-efficient, protein efficiency ratio and net protein ratio.

UNIT – III

ENERGY – Definition, units, calorific value of foods – Bomb calorimeter, physiological energy value of foods. Energy requirement and balance – basal metabolism, thermic effect of food, types of physical activity, direct and indirect calorimetry.

WATER – Biological functions, distribution in body, requirements, regulation of water balance, fluid, electrolyte and acid-base balance.

UNIT – IV

MINERALS – Macro minerals – calcium, phosphorus, sodium, potassium and chloride; Other minerals – iron, iodine, copper, zinc and fluoride – biological role, food sources, requirements, deficiency / toxicity and   prevention. Trace minerals –potential health benefits of trace minerals.

UNIT – V

VITAMINS – Fat soluble vitamins – A, D, E and K; Water soluble vitamins –vitamin C, thiamine, riboflavin, niacin, folic acid, B6 and B12 – Biological role, food sources, requirements, deficiency / toxicity and prevention.

PHYTO CHEMICALS – Brief on non nutritive food components and their potential health relation – polyphenols, tannins, phytates, phytoestrogen, cyanogenic compounds, lectins and saponins.

REFERENCES :- HUMAN NUTRITION

1. Antia.F.P and Philip Abraham, 2002, "Clinical Dietetics and Nutrition, Oxford University Press.

2. James L.Groff and Sareen S. Gropper, 1999, Advanced Nutrition and Human metabolism, wadsworth/ Thomson Learning.

3. Garrow, J.S. James, W.P.T and Ralph, A., 2000, "Human Nutrition and   Dietetics", Churchil Living stone, Edinburgh.

4. Srilakshmi.B, 2002, Nutrition science, New Age International Publishers.

5. Gopalan C Ramasastry and Balasubramaniam., 2000, Nutritive Value of Indian Foods, NIN, Hyderabad.

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SEMESTER- V
CORE PAPER –VI
DIETETICS-I

OBJECTIVES

To enable students:

1. To obtain knowledge on the role of diet in disease conditions.

2. To gain experience in planning, preparing and serving therapeutic diets.

UNIT – I

DIET THERAPY : - Definition, purpose and principles of a therapeutic diet, factors to be considered in the modification of normal diet into therapeutic diets. Types of hospital diet – Clear fluid, full fluid, soft light, bland and regular diet. Special feeding methods – tube feeding, parental nutrition.

DIETITIAN: – Role of dietitian in managing hospital dietary.

UNIT – II

DIABETES MELLITUS:- Prevalence, Types – Type-I, Type-II, Malnutrition Related Diabetes Mellitus, Gestational Diabetes Mellitus, Etiology, symptoms, nutritional requirements and dietary management of Diabetes Mellitus – (Glycemic Index, Food exchange list) and complications.

UNIT – III

CARDIOVASCULAR DISEASE:- Prevalence, Pathogenesis, Symptoms, risk factors and modification of diet in cardiovascular disease – Atherosclerosis, Hypertension and Hypercholesterolemia .

UNIT – IV

DIET IN INFECTIONS AND FEVERS:- Host defense mechanisms causes and general dietary conditions of fevers – Symptoms and signs of Typhoid, Influenza, Malaria, Tuberculosis and AIDS.

UNIT – V

DISEASES OF THE GASTRO INTESTINAL TRACT:- Causes, Symptoms and Dietary management of Peptic ulcer; diarrhoea, constipation, malabsorption syndrome, haemorrhoids, ulcerative colitis.

REFERENCES- DIETETICS-I

1. Sue Rodwell Williams Nutrition and Diet therapy 1985. The C.V.Mosby Saint Louis.

2. Bogeri, J.G.V Brigg – D.H. Colloway, Nutrition and Physical Fitness 1973, W.B. Saunders Philadesphra – London.

3. F.P.Antra Clinical Nutrition & Dietetics 1973. Oxford University Press, Delhi, London, New York.

4. M.V.Krause & M.A. Mahan, Food Nutrition and Diet Therapy 1992. W.B. Snders Company, Philadelphia London, Toronto.

5. Robinson, C.H. Lawles, M.R.Chenoweth, W.L. Garwick, A.E. Normal and Therapeutic Nutrition 1990. The Macmillan Company, New York.

6. M.Swaminathan, Essential of Nutrition Vol I & II 1974. The Ganesy and company, Madras – 17.

7. K.M. King, F.Morley, R & Burgess, Nutrition for developing countries 1972, Oxford University Press, Delhi, London, New York.

8. Wilson, E.P, Fisher K.H and Fuqua M.E Principles of Nutrition 1975. John Willey & Sons New York, London.

9. G.A.Helen – Introductory Nutrition 1974; C.V. Mosby Company Saint Louis.

10. C.Gopalan S.C Balasubramanian S.V. Ramestri and Vesweswara Rao Diet Atlas.1971, ICMR New Delhi, India.

11. Aykroyd, W.R. Gopalan C and S.C Balsubramanian the nutritive values of Indian foods & planning of satisfactory diets 1971, ICMR New Delhi.

12. Davidson & Passmore R & Brock J.B Human Nutrition &Dietetics, 1976. The English Languages Bood Society & Chruchill Living Stone.

13. David, M.Paize et al. Clinical Nutrition, 1988 C.V. Moshy Co. St. Louis.

JOURNALS

1. Journal of American Dietetics Association, American Dietetic Association, U.S.A.

2. India Journal of Nutrition and Dietetics – Avinashilingam Institute for Home Science and High Education Coimbatore.

SEMESTER- V
CORE PAPER –VII
NUTRITION THROUGH LIFE CYCLE

OBJECTIVES

1. To understand the role of nutrition in different stages of life cycle and meal planning.

2. To understand nutrient requirement / needs of individuals at different stages of life cycle.

3. To discuss major nutritional nutrition concerns at each stage of life.

UNIT – I

RECOMMENDED DIETARY ALLOWANCES – Definition, basis for requirements through different stages of life, components required to derive RDA, reference man and reference women, RDA of Indians.

NUTRITION DURING INFANCY – Nutritional requirements, growth monitoring. colostrum – composition, importance in feeding, initiation and exclusive breast feeding. Composition of human milk and cows milk, anti infective factors. Premature infants and low birth weight infants and their feeding formulas. Weaning – supplementary and complementary feeding.

UNIT II

NUTRITION DURING PRE SCHOOL – Food and nutritional requirements, factors influencing food intake and food habits. Nutritional concern – PEM, anaemia, obesity, dental carries and vitamin A deficiency.

NUTRITION DURING SCHOOL – Physical development and nutritional requirements, food habits and food choices, packed lunch and school lunch programs.

UNIT – III

NUTRITION DURING ADOLESCENCE – Food and nutritional requirements, factors influencing food intake. Nutritional concern – Anaemia, under weight, obesity, anorexia and bulimia.

NUTRITION IN ADULTHOOD – Food and nutritional requirements, physical activity and energy relationship, nutrition and work efficiency. Nutritional concern – obesity, under weight, anaemia, osteoporosis and universal precautions for maintaining good health.

UNIT IV

NUTRITION DURING PREGNANCY – Stages of pregnancy, physiological nutrition needs and support, nutritional requirements and additional allowances, common nutrition related problems and complications.

NUTRITION DURING LACTATION – Physiological adjustments during lactation, nutritional requirements and additional allowances, efficiency of milk production, lactogogues, diet of lactating women.

UNIT – V

GERIATRIC NUTRITION – Physiological changes in ageing, psycho social and economic factors affecting eating behavior and food intake. Nutritional needs Nutrition related problems and modification of diet.

REFERENCES:- NUTRITION THROUGH LIFE CYCLE

1.   Shills,M.E., Olson,J., Shike,M., and Roos,C., (1998), 9th edition, Modern Nutrition in Health and Disease, Williams and Williams. A. Beverly Co. London.

2.   Williams, M.H., (2002), Nutrition for Health and Fitness, Mc Graw Hill, Boston.

3.   Srilakshmi, B., (2003), Dietetics, New Age International, New Delhi.

4.   Clark,N., Sports Nutrition Guide Book, Versa Press, U.S.A., 1997.

5.   Gopalan C Ramasastry and Balasubramaniam., 2000, Nutritive Value of Indian Foods, NIN, Hyderabad.

SEMESTER – V
CORE PRACTICAL – III
HUMAN NUTRITION

1. Reactions of Monosaccharides – glucose, fructose, galactose;

      Disaccharides – maltose, lactose, sucrose;

      Polysaccharides – starch, dextrin, glycogen;

      And their identification in unknown mixtures.

2. Estimation of reducing sugar by Benedicts method.

3. Reactions of Aminoacids- tryptophan,arginine,tyrosine,cysteine & cystine;
  And their   identification in unknown mixtures.

4. Estimation of ascorbic acid content of foods by titrimetric method.

5. Estimation of calcium in foods by titrimetric method.

6. Estimation of phosphorus by colorimetric method.

SEMESTER – V
CORE PRACTICAL –IV
DIETETICS-I & NUTRITION THROUGH LIFE CYCLE PRACTICAL

DIETETICS-I

Planning and preparing of diets for the following conditions/ stages.

1. Clear fluid, full fluid and soft diet.

2. Diet in fever – Typhoid, tuberculosis.

3. Diet in obesity and under weight.

4. Diet in atherosclerosis and hypertension.

5. Diet in ulcer, diarrhoea and constipation.

6. Diet in hepatitis and cirrhosis of liver.

7. Diet in diabetes mellitus with and without insulin.

8. Diet in Nephritis and Nephrosis.

9. Visit to the dietary department of hospital.

10. Dietary internship program for a month.

NUTRITION THROUGH LIFE CYCLE

1. Formulation and preparation of weaning foods for Infants.

2. Planning, Preparation and Nutrient Evaluation of Balanced Diets for,

       a. Infant

       b. Pre-School Child

   c. School going child

   d. Adolescence

   e. Adulthood

   f. Elderly people

   g. Athletes

3. Planning, Preparation and Nutrient Evaluation of Menus for Special Physiological Conditions,

   a. Expectant women.

   b. Lactating women.

SEMESTER V
ELECTIVE I
NUTRITIONAL BIOCHEMISTRY

OBJECTIVES

   To describe the concepts and chemistry of nutrients.

   To understand macro nutrient metabolic pathways and its regulation.

To gain an insight into nutrigenomics; inter-relationship between micro nutrients and metabolic pathways.

UNIT – I

INTRODUCTION to biochemistry - scope and inter-relationship between biochemistry and other biological sciences.

CARBOHYDRATES – structure and properties of monosaccharides – glucose, fructose, galactose; disaccharides – maltose, lactose, sucrose; polysaccharides – glycogen, dextrin, starch. Biological oxidation and its bio-energetics - glycolysis, citric acid cycle, electron transport chain oxidative phosphorylation, gluconeogenesis. Hormonal regulation of blood glucose level.

UNIT – II

PROTEINS – Structure and properties of amino acids, essential, semi-essential and non-essential amino acids. Structure and properties of primary, secondary and tertiary proteins. General reactions of amino acids. Deamination, transamination, decaboxylation and disposal of carbon skeleton of amino acids. Ammonia formation and urea cycle.

UNIT – III

LIPIDS – Types and properties of fatty acids, composition and properties of lipids. Structure of phospholipids and glycolipids. Types and structure of sterols. Significance of acid value, iodine value and saponification value. Beta oxidation of fatty acids, bio-synthesis of cholesterol and its significance. Ketone bodies – types, ketosis and ketogenic diets.

UNIT – IV

NUCLIC ACID – Types, components and structure. DNA – Double helical structure, replication, transcription and genetic code. Elementary knowledge on bio synthesis of proteins.

ENZYMES AND CO-ENZYMES – Definition, types and classification. Mechanism of enzyme action, factors affecting velocity of enzyme catalyzed reactions, specificity of enzymes, isozymes, enzyme inhibition.

UNIT – V

INBORN ERRORS OF METABOLISM – Carbohydrate – lactose intolerance, fructosuria, galactosemia and G6PD deficiency. Protein – phenylketonuria, alkaptonuria, maple syrup urine disease, homocystinuria.

Lipids – medium chain acylCoA deficiency disease (MCADD) and long chain acylCoA deficiency disease (LCADD).

VITAMINS – Biochemical role of vitamins.

MINERALS – Biochemical role of inorganic elements.

REFERENCES :- NUTRITIONAL BIOCHEMISTRY

1. Murray, R K., Granner, D K., Mayes, P A and Rodwell, V W (2012), 29th edition, Harper's Bio chemistry, Lange Medical Book.
2. Conn, E.E., Stumpf, P.K., Bruening, G. NS Doi, R.H., (2001), 5th edition, Outlines of Biochemistry, John Wiley and Sons.
3. Sathyanarayan, U., (2006), 3rd edition,Biochemistry, New Central Book Agency (pvt) Ltd.
4. Jain, J.L., (2004), 6th edition, Fundamentals of Biochemistry, S. Chand publisher.
5. Nelson, D.L. and Cox, M.M. (2000), 3rd edition, Leninger's Principles of Biochemistry, Macmillan worth publisher.

SEMESTER-V
SKILL BASED SUBJECT-III
INTERIOR DECORATION

OBJECTIVES

1. To understand the principles and methods of art and design.

2. To learn skills in using the basic principles of art at home, in commercial situations and other occasions.

3. To apply theoretical knowledge in interior decoration to practical situation.

UNIT I INTRODUCTION TO INTERIOR DECORATION

Objectives of interior decoration, Design – Elements of Designs, Types of designs, Characteristics of good designs .

UNIT II PRINCIPLES OF DESIGN

Proportion, Balance, Emphasis, Rhythm, Harmony .

UNIT III COLOUR

Classification and characteristics of colour, Emotional effect of colour scheme, Colour wheel, Colour schemes, Prang colour chart Use of colour in interior decoration.

UNIT IV FURNITURE AND FURNISHINGS

Styles of furniture- Traditional , Contemporary and modern. Selection, arrangement and care of furniture and furnishing .

UNIT V LIGHTING AND ACCESSORIES

Classification, Quantity and quality of light, Types of lightings, Sources of lighting

ACCESSORIES:

Selection, use and care of accessories
> i) Pictures
> ii) Flower arrangement
> iii) Napkin folding.

REFERENCES: INTERIOR DECORATION

1. Anna H. Rutt (1961), Home Furnishing, Jony Wiley Eastern Private Ltd., New York.

2. Ball,Victoria Kloss (1982),Art of Interior Design, John Wiley and Sons.

3. Conran Terrace (1985), New House Book, Guild Publication, London.

4. Deshpannde .R.S (1980), Modern Ideal Homes for India(9th Edition), Smt L.S Deshpande for Deshpande trust.

5. Gilliat Mary (1983), Making the most bedrooms and bathrooms, Orbis Publishing, London.

SEMESTER- VI
CORE PAPER-   VIII
DIETETICS -II

Objectives:

To enable students to

1.Gain knowledge about principles of diet therapy and different therapeutic diets.

2.Develop aptitude for taking up dietetics as a profession

UNIT I

LIVER AND GALL BLADDER – Etiology, clinical symptoms and modification of diet in disease of Liver and Gall bladder.

a) Hepatitis , b) Cirrhosis, c)Hepatic Encephalopathy d)Cholecystitis e) Cholelithiasis.

UNIT II

OBESITY AND UNDERWEIGHT – Etiology, Assessment of Obesity and modification of diet in Obesity and Underweight.

UNIT III

KIDNEY DISEASES - Etiological factors, Etiology and modification of diet in disease of the Kidney-Glomerulo Nephritis, Nephrosis ,Acute and Chronic Renal Failure ,Dialysis ,Urinary Calculi.

UNIT IV

CANCER - Risk factors ,symptoms ,Nutritional problems of cancer therapy and modification of diet in cancer ,role of antioxidants in cancer.

UNIT V

FOOD SENSITIVITY AND GENETIC DISORDERS

FOOD SENSITIVITY - Types of reaction ,symptoms ,Diagnosis and treatment.

GENETIC DISORDERS - Symptoms and management of diet in phenylketonuria , Galactosemia , Fructrosuria.

REFERENCES

1.Antia, F.P, Clinical dietetics and Nutrition ,4th Edition, Oxford University Press, Delhi,2002.

2. Joshi, S.A, Nutrition and Dietetics,2nd edition, TATA McGraw Hill publications, New Delhi.2008.

3.Mahan,L.K.,Arlin.M.T.,Krause's,Food,NutritionandDietTherapy,11thedition, W.B.Saunder Company, London ,2000.

4. Williams S.R.,Nutrition and Diet Therapy, 6th Edition,Times Mirror / Mosby College Publishing, St. Louis, 1989.

5. Raheena Begum, A Text Book of Foods, Nutrition and Dietetics, Sterling Publishers, New Delhi.

6. National Institute of Nutrition, Dietary Guidelines for Indians – A Manual, Hyderabad, 2005

7. Srilakshmi. B, Dietetics, 5th Edition, New Age International (P) Ltd, Publishers, Chennai, 2005

8. Shills, M.E, Oslon, J.A, Shike, M and Ross, A.C, Modern Nutrition in Health and Disease, 10th Edition, Lippincott Williams and Wilkins 2006.

SEMESTER-VI
CORE PAPER -IX
FOOD SERVICE MANAGEMENT

Objectives:

1.To understand the basic principles of management in food services units.

2.To develop managerial skills among the students.

3.To understand the concept and principles of management.

UNIT- I

a)FOOD SERVICE INDUSTRY: Definition – types of catering- Hotel, Motel, Restaurant, Cafeteria and chain hotels.

b)WELFARE – Hospital, School lunch, Residential establishment and Industrial catering.

c)TRANSPORT – Air, Rail, Sea and Space, Miscellaneous – Contract and outdoor.

UNIT – II: PHYSICAL PLANT AND FOOD PURCHASE

a) Layout of kitchens, types of kitchens – Planning of Receiving and storage space of foods, table setting, Dishwashing.

b)FOOD PURCHASE- Procedures and Factors involved in the selection of food.

UNIT – III: QUANTITY FOOD SERVICE AND EQUIPMENTS

a) QUANTITY FOOD SERVICE: Definition, objectives, styles of service- waiter service, self – service, vending. Mechanics of waiter service.

b) EQUIPMENT: Classification, factors involved in selection, use and care of major equipments.

UNIT – IV

a) MANAGEMENT- Definition, principles, Functions and tools of management, qualities of a good leader, styles of leadership.

b) RESOURCE MANAGEMENT – Money, Time, Energy, Computer applications in food service institutions.

UNIT – V

a. PERSONNEL MANAGEMENT- Recruitment, selection and induction. Financial management**-** Cost control- methods of food cost control.

b. **SANITATION AND SAFETY:-** Sanitation of plant and kitchen hygiene. Safety at work

PERSONAL HYGIENE - personal health and hygiene.

REFERENCES:

1. Kaufman,R. Mega planning-practical tools for organisational success, sage publications inc ,2000

2. Shring .Y ,P.Effective food service management, anmol publications private ltd

3. Ingredients for success ,Delmer-Thomson learning ,2001

4. Yadav,C.P Management of hotel and catering industry, anmol publication, pvt ltd

5. Mohini Sethi and Surjeet Malham, " Catering Management – an integrated approach", 2nd edition, Wiley Eastern Limited, New Delhi, Reprint 2007.

CORE PRACTICAL – IV- A
FOOD SERVICE MANAGEMENT

1. Visit to well- organized food services units.

2. Hostel commercial Industrial Hospital Transport.

3. Table setting and service- appraising and drawing silver cutlery and crockery folding of Napkins – Laying of table cloth, table mats- Arrangement of cover and table- appointment according to the menu- serving food at the table clearing of the table.

4. Standardization any 3 selected quantity recipes and their preparation. Calculation of nutritive value, yield of cost per serving- size of serving.

5. Quantity cookery: preparation of south Indian, north Indian and western menu for 25 members.

6. Organizing, preparing and serving one special meals for 50 members.

7. Designing the interiors of food service areas in various food service outlets.

SEMESTER – VI
ELECTIVE - PAPER - II
COMMUNITY NUTRITION

OBJECTIVES

To enable the students to:
1. Understand the malnutrition problems and its prevalence in India

2. Gain knowledge on the national effort in combating malnutrition

3. Appreciate the national and International contributors towards national improvement in alleviating nutrition problems.

UNIT-I

Nutrition and National Development

Malnutrition - Etiology, symptoms, Prevalence of malnutrition - Under nutrition and over nutrition, balance between food and population growth.

UNIT-II
Methods of assessment of nutritional status.

- Direct assessment -Anthropometric measurements, biochemical estimations, clinical assessment, diet surveys and growth monitoring.
- Indirect assessment -Agricultural data, ecological parameters, socio economic indices and vital statistics.

UNIT-III

Common Nutritional Problems in India –
PEM - Classification, etiology, symptoms, pathological changes.
Anemia - etiology, symptoms, prophylaxis programmes.
IDD - Etiology, symptoms, prophylaxis
Vitamin A deficiency - Etiology, symptoms, prophylaxis .

UNIT-IV

Role of National and International organizations in combating Malnutrition –
National Institute of Public Cooperation and Child Development(NIPCCD), Cooperative of American Relief Everywhere (CARE), Food and Agricultural Organization (FAO), National Institute of Nutrition(NIN), National Nutrition Monitoring Bureau (NNMB), Central Food Technological Research Institute(CFTRI), Integrated Child Development Scheme(ICDS),National Mid-day Meal Program. Integrated Child Development Scheme (ICDS), Indian Council for Agricultural Research (ICAR), World Health Organisation (WHO) , United Nation Children Emergency Fund (UNICEF) and Tamilnadu Integrated Nutrition Project (TINP).

UNIT-V

Nutrition Education - Meaning, Scope, Methods - Planning, conduct and evaluation of Nutrition education Programme.

REFERENCES: COMMUNITY NUTRITION

1. Applied Nutrition and Health Education, Sabarwal B, Common wealth publishers, New Delhi.

2. Challenges in Rural Development - Senha H.K, Discovery publishing.

3. Food consumption and planning - Vol V, International encyclopedia.

4. Foundations of Community Health Education, Mc Graw Hill, London.

5. Health and Hygiene - A Lesties Banks and Hislop J.A., Universal Tutorial Press, London.

6. Nutritional Problems of India, P.K. Shukla, Prentice Hall, India.

7. Park and Park, Social and Preventive Medicine, 20th edition, banarsidar bhanot publishers, 2009.

8. Swaminathan.N, Essentials of Food and Nutrition, Vol I and Vol II.

9. Theory and practice of public Health, Oxford University press, London.

SEMESTER – VI
ELECTIVE PAPER
BIOTECHNOLOGY

OBJECTIVES

To create interest and to be aware of the growing importance and controversies of biotechnology.

To understand the application of biotechnology in the field of food science, nutrition and dietetics. To understand the process and procedures used in food biotechnology.

UNIT – I

BIOTECHNOLOGY – Definition, scope and application. Genetic engineering – scope and importance, basic tools and techniques, recombinant DNA and its applications, recombinant organisms and gene therapy. Safety, social, moral and ethical considerations in genetic engineering.

UNIT II

FERMENTATION TECHNOLOGY - Fermentors – principle, types, mode of operation, stages of fermentation process, rate of microbial growth and death, product recovery and purification. Fermentation products – alcoholic beverages and organic acids.

UNIT III

ENZYME BIOTECHNOLOGY – Sources and production of commercially important enzymes – cellulose, amylase, pectinase, proteinase and lipase. Application of enzymes in bakery, fat / oil industries, cheese making and beverage production. Imobilization of enzymes and its applications.

UNIT IV

PLANT BIOTECHNOLOGY – Need for development of new genetic trait conferring nutritional improvement. Basics of plant engineering towards development of enriched food products. Genetically modified foods (GM) – potential benefits and controversies with special reference to golden rice, brinjal, tomato, potato and mustard.

UNIT V

VACCINE TECHNOLOGY – Principle of vaccination, brief on vaccines – DNA vaccines, recombinant vaccines, bacterial vaccines, viral vaccines.

BIO-CONVERSIONS – Role of bio-technology in Bio-fuel generation, Bio-pesticides, Bio-fertilizers and Bio-remediation.

REFERENCE: BIOTECHNOLOGY

1. Dubey, R.C., (2008), A Text Book of Biotechnology, S.Chand and Co, New Delhi

2. Kreuzee and Massey, A., (2001), Recombinant DNA and Biotechnology, ASM Press.

3.Verma and Verma (2007), Plant Physiology, S. Chand and Company Ltd, New Delhi.

4. Sathyanaranya., (2005), Biotechnology, Uppla Publishers Interlinks, Vijayawada.

5. Ramasamy, P., (2002), Trends in Biotechnology, University of Madras Publications, Pearl Press.

SEMESTER – VI
SKILL BASED SUBJECT
HEALTH AND FITNESS

OBJECTIVES:

To enable the students to

1. Train and develop professionals with expertise in health and fitness management for services in wellness centers and sports academics.
2. Learn and practice exercises to help them overcome challenges of student life.

UNIT - I: HEALTH AND PHYSICAL FITNESS

Definition of health. Dimensions of health, Factors influencing health and wellbeing, indicators of health and responsibility in maintaining good health. Physical fitness – Definition, Parameters of fitness, Muscular strength, Muscular and cardiovascular endurance. Physical fitness tests- for flexibility.

UNIT – II :NUTRITION AND FITNESS

Role of nutrition in fitness, Nutritional guidelines for health and fitness, importance of nutritional supplements, Fad diets. Importance of nutrition in preventing life style disease- diabetes mellitus

UNIT – III: SPORTS FITNESS

Introduction Fuels and nutrients to support sports activities, Mobilization of fuel stores during exercise- aerobic and anaerobic exercises, importance of carbohydrate loading, pre-game meal, and post game meal. Dietary supplements for athletes, sports drinks, sports bar.

UNIT- IV: YOGA AND FITNESS

principles of yoga therapy, social skills and living value based education. Yogic concepts in various diseases like diabetes, Cardio vascular diseases, digestion and immune system, and reproductive health. warm up exercises & basic asanas - Simplified physical exercises and body stretching practices. Basic asanas, suryanamaskar, breathing exercise- pranayama.

UNIT – V: SPECIAL NUTRITION

Space Nutrition – Need and scope for space travel, nutrient requirements and dietary management during space travel. **Military Nutrition** – Optimal nutritional requirement and nutritional guidelines for military personnel. **Sea and Air Travel Nutrition** – Nutrient requirement and dietary management during sea and air travel.

Reference:

1. K. Park Test book of preventive and social medicine, 15th edition, MIS Banarsidas Bhano Publishers, Jabalpur, 1997.

2. Melvin H.Williams, Nutrition for Health, fitness and Sports, 7th edition, MC Graw Hill international Edition, 2005.

3. Shills, E.M. Olson, A.J. and Shike, Lea and Febiger, Modern Nutrition in Health and Diseases,Lippincott Williams ans Wilkins publishing,2006

4. Shubhangini A Joshi, Nutrition and Dietetics, 3rd edition, Tata McGraw Hill Education private limited, New Delhi, 2011.

5. Mary Bronsow Merki and Dow Merki - Health - a guide to wellness

6. Jangalaw Bishop - fitness though aerobic dance.

Objectives:

To enable the students to

3. Understand the importance of health and fitness
4. Establish a wellness lifestyle by teaching fitness activities.
5. Learn and practice exercises to help them overall challenges of student life.

UNIT I

Health: Definition of health and wellness, Factors affecting health and wellness. Dimensions of health, Health hazards- consequence of junk food over health, healthy eating habits.

UNIT II

FITNESS - Definition, parameters of fitness, muscular strength, muscular and cardiovascular endurance , physical fitness tests- for flexibility.

UNIT III

YOGA AND FITNESS - principles of yoga therapy, social skills and living value based education. Yogic concepts in various diseases like diabetes, Cardio vascular diseases, digestion and immune system, and reproductive health. warm up exercises & basic asanas **-** Simplified physical exercises and body stretching practices. Basic asanas, suryanamaskar, breathing exercise-pranayama

UNIT V

SPECIAL NUTRITION - Basic knowledge on sports, military, sea voyage and space nutrition.

REFERENCE: HEALTH AND FITNESS

1. K. Park Test book of preventive and social medicine, 15th edition, MIS Banarsidas Bhano Publishers, Jabalpur, 1997.

2. Melvin H.Williams, Nutrition for Health, fitness and Sports, 7th edition, MC Graw Hill international Edition, 2005.

3. Shills, E.M. Olson, A.J. and Shike, Lea and Febiger, Modern Nutrition in Health and Diseases,Lippincott Williams ans Wilkins publishing,2006

4. Srilakshmi.B, Dietetics, New Age International Publishers, New Delhi, 2010

5. Shubhangini A Joshi, Nutrition and Dietetics, 3rd edition, Tata McGraw Hill Education private limited, New Delhi, 2011.

6. Mary Bronsow Merki and Dow Merki - Health - a guide to wellness

7. Jangalaw Bishop - fitness though aerobic dance.

Muthurangam Government Arts College (A) - Vellore

M.Sc. FOODS AND NUTRITION

DEGREE COURSE

CBCS PATTERN

(With effect from 2018-2019)

The Course of Study and the Scheme of Examinations

S. NO	Study Components	Course Title	Ins. hrs/ Week	Credit	Title of the paper	Maximum Marks		
						CIA	Exam	Marks
SEMESTER I						CIA	Exam	Marks
1	MAIN	Paper-1	5	4	Applied Physiology	25	75	100
2	MAIN	Paper-2	5	4	Advanced Food Science	25	75	100
3	MAIN	Paper-3	5	4	Nutrition for Health	25	75	100
4	MAIN	Paper-4	4	4	Food Microbiology	25	75	100
5	MAIN PRACTICAL	Practical –I	6	4	Advanced Food Science & Nutrition for Health	25	75	100
6	ELECTIVE I	Paper-1	5	3	Functional Foods and Nutraceuticals	25	75	100
			30	23		150	450	600
SEMESTER II						CIA	Exam	Marks
7	MAIN	Paper-5	6	5	Advanced Nutrition I	25	75	100
8	MAIN	Paper-6	6	5	Advanced Nutrition II	25	75	100
9	MAIN	Paper-7	5	4	Research Methodology and statistics	25	75	100
10	MAIN PRACTICAL	Practical -II	6	4	Food Analysis	25	75	100

11	ELECTIVE II	Paper-2	5	3	Nutrigenomics	25	75	100
12	COMPULSORY PAPER		2	2	Human Rights	25	75	100
			30	**23**		**175**	**525**	**600**
	SEMESTER III					**CIA**	**Exam**	**Marks**
13	MAIN	Paper-8	6	5	Diet Therapy-1	25	75	100
14	MAIN	Paper-9	6	5	Diet Therapy -2	25	75	100
15	MAIN	Paper-10	6	5	Biochemical basis of Nutrition	25	75	100
16	MAIN PRACTICAL	Practical-3	6	4	Diet Therapy -1 &2	25	75	100
17	ELECTIVE III	Paper-3	5	3	Food Processing and Preservation	25	75	100
18	VIVA VOICE			2	Internship	25	75	100
19	DEMONSTRATION		1		Journal Club			
			30	**24**		**150**	**450**	**600**
	SEMESTER IV					**CIA**	**Exam**	**Marks**
20	MAIN	Paper-11	6	5	Community and Public Health Nutrition	25	75	100
21	MAIN	Paper-12	5	4	Food Standards and Quality Control	25	75	100
22	ELECTIVE-IV	Paper-4	5	3	Food Biotechnology	25	75	100
23	MAIN PRACTICAL-IV	Practical-4	6	4	Nutritional Assessment And Diet Counseling	25	75	100
24	PROJECT/ DISSERTATION		8	4		25	75	100
			30	**20**		**125**	**375**	**500**

S.NO	SUBJECT	PAPERS	CREDITS	TOTAL CREDITS	MARKS	TOTAL MARKS
1	MAIN PAPER	12	4-5	54	100	1200
2	MAIN PRACTICAL	4	4	16	100	400
3	INTERNSHIP	1	2	2	100	100
4	DISSERTATION	1	4	4	100	100
5	ELECTIVE	4	3	12	100	400
6	COMPULSORY PAPER	1	2	2	100	100
	Total	**23**		**90**		**2300**

MUTHURANGAM GOVERNMENT ARTS COLLEGE (A)-VELLORE

M.Sc. FOODS AND NUTRITION

SYLLABUS UNDER CBCS

(With effect from 2018-2019)

SEMESTER I
PAPER – 1   APPLIED PHYSIOLOGY

OBJECTIVES

Enable the Students :

To understand the general structure and functions of various systems and organs of our body.

To understand the abnormal changes in tissues and organs in diseased condition.

UNIT-I   CELLULAR BASIS OF PHYSIOLOGY

Body fluid compartment, Membrane potential, Inter cellular communication - Homeostasis. Biochemical aspects of muscle tissue - structure, chemical composition, Mechanism and energetic of muscle contraction, muscle fatigue.

UNIT-II CIRCULATORY AND GASTRO INTESTINAL SYSTEM

Blood - composition, functions of formed elements of blood and plasma proteins, Anatomy and physiology of heart , origin and conduction of heart beat, ECG-interpretation, Latest development in cardiac condition, cardio vascular mechanism and homeostasis.

Anatomy and physiology of gastrointestinal tract, movement of intestine. Mechanism of secretion of gastric juice. Hunger, Appetite, Satiety - physiological and psychological factors affecting food intake, Circadian rhythm GI tract secretions.

UNIT-III RESPIRATORY AND EXCRETORY SYSTEM

Oxygen requirement for nutrients, composition of inspired and expired gas, partial pressure of gas, diffusion gradient and gas flow, transport of oxygen and CO_2, Haemoglobin affinity for O_2 and dissociation.

Excretion - formation of urine, characteristics of urine, normal and abnormal constituents of urine, acid - base balance .

UNIT-IV   NERVOUS SYSTEM AND IMMUNITY

Nervous system – Anatomy and physiology of brain , spinal cord and neuron(briefly), conduction of nerve impulses, role of neurotransmitters; blood brain barriers, Cerebrospinal fluid, hypothalamus and its role in various body functions.

Immunity - Properties, natural and acquired Immunity, features of immune responses, antigen - antibodies - types, properties, and mechanism, Auto immune disorder and allergy (review).

UNIT-V ENDOCRINOLOGY AND REPRODUCTION

Anatomy and physiology of endocrine glands. Hormones - Mode of action, functions of hormones of the endocrine glands - Pituitary, Adrenal, Thyroid, Gonadal hormones, Pancreas, Pineal body and Parathyroid, Hypo and Hyper functions of the glands.
General anatomy –Female and male reproductive system .Testis-Spermatogenesis, male sex hormones, Ovaries-female sex hormones , menstrual cycle and menopause.

REFERENCES:

1. Guyton, A.G. and Hall, J.B. (2005): Text Book of Medical Physiology, 9th Edition, W.B. Sanders Company, Prism Books (Pvt.) Ltd., Bangalore.

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4. Nutrition and Human Performance, 4th Edition, Williams and Wilkins, Baltimore.

5. Best ,H and Taylor,B.,1992.The physiological basis for Medical Practice,8 th Edition,The Williams and Wilkins Company

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7. Chaudhuri,K (1997) Concise Medical Physiology, 2nd Edition, New Central Book Agency (P) Limited, Calcutta-9.

8. Vidya Ratan (1993), Hand Book of Human Physiology, 7th Edition, Jay pee Brothers Medical Publishers (P) Limited, New Delhi.7 and 8 in the syllabus

PAPER – 2
ADVANCED FOOD SCIENCE

OBJECTIVES

Enable the Students
- To understand the principles of cooking.
- To learn the composition of various foods.
- To study the changes in food stuffs during processing and cooking.

UNIT-I   Physico Chemical Changes in Foods

Physical properties of water, structure of water and ice, types of water in foods, water soluble interactions, role of water in food systems, Hydrogen ion concentration (pH), Solubility, Solutions, Crystallization, Emulsification, Osmosis, Enzyme action (SS), Oxidation – reduction, Colloids – Stabilizations and properties.

UNIT- II   Cereals and pulses

Components and characteristics of food starches, Swelling of starch granules, Gel formation, factors affecting gelatinization, Retrogradation, syneresis, effect of sugar, acid, fat and surface active agents on starch . Stages of sugar cookery (SS), Crystal formation, factors affecting, types of candies, Action of acid, alkalies and enzymes.

Germination and factors affecting germination . Toxicity in pulses-Lathyrism, flavism, Gluten-formation factors affecting their formation, Leavening agents.

UNIT- III   Vegetables and Fruits

Vegetables - Structure, Classification, Composition, Nutritive value, Methods of Cooking, Changes in Cooking .
Fruits - Structure, Classification, Composition, Ripening of fruits, changes on ripening, Pectic substances, Cooking changes.

UNIT-IV   Egg, Meat and Fish

Egg - Structure, Composition, Nutritive value, Grading, Methods of Cooking and Role of egg in cookery.
Meat - Structure, Composition, Nutritive value, Classes and Grades of meat cuts, Changes on cooking and Rigor mortis. Poultry - Composition, Nutritive value, Grades, Methods of cooking, Effects of cooking.
Fish - Composition, Nutritive value, Types, Cuts, Selection, Spoilage, Cooking and Factors effecting cooking quality.

UNIT-V

Milk and Milk Products - Composition, Nutritive value, Constituents, Properties of milk, Effects of acid and Salt, Heat on milk proteins and coagulation. Milk products - Ice cream, Types, Crystal formation and Dairy forms.

Fats & Oils – Types, properties of fat relating to cooking, Rancidity, Tests for rancidity, Hydrogenation, Changes in fat during heating, Factors affecting fat absorption, Shortening, Use of fat in tenderness of cooked products.

Beverages - Classification, Nutritive value, Preparation of milk based beverages.

Spices and Condiments - Use of spices and condiments in Indian cookery .

REFERENCES

1. Charley, H. (1982): Food Science (2nd edition), John Wiley & Sons, New York.
2. Potter, N. and Hotchkiss, J.H. (1996): Food Science, Fifth edition, CBS Publishers and Distributors, New Delhi.
3. Belitz, H.D. and Grosch, W. (1999): Food Chemistry, (2nd edition), Springer, New York.
4. Abers, R.J. (Ed) (1976): Foams, Academic Press, New York.
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9. Christian, E.W. Essentials of Food Science, XXIV edition, WWW.Springer.com/978-14614-9137-8. 2014.

PAPER – 3
NUTRITION FOR HEALTH

OBJECTIVES

- To know the computation of allowances.
- To impart knowledge on the importance of nutrition during life span.
- To enlighten on the dietary modifications.

UNIT-I Introduction and General Concepts Of Nutrition

Recommended dietary allowances - RDA for Indians, basic requirements, computation of allowances based on energy expenditure, components of energy expenditure. General concepts about growth and development through different stages of life span.

UNIT-II Nutrition in Pregnancy

Stages of gestation, maternal weight gain, complications of pregnancy, maternal physiological adjustments, nutritional problems and dietary management, importance of nutrition during and prior to pregnancy, teenage pregnancy - nutritional problems and dietary management, planning a menu.

UNIT-III Nutrition in Lactation

Physiology of lactation, hormonal control and reflex action, efficiency of milk production, problems of breast feeding, nutritional composition of breast milk, nutritional needs and requirements during lactation, special foods during lactation, dietary modifications, planning a menu.

Nutrition in Infancy

Infant feeding, nutritional needs for premature infant and their feeding, weaning foods. Feeding problems, over infant formulas, lactose intolerance, and menu planning. Nutrition in Pre-school - Physiological development related to nutrition, feeding problems, behavioural characteristics, nutritional requirement and planning diet.

UNIT-IV Nutrition in school children

Nutritional requirements for school children and factors to be considered for menu planning, feeding problems, and packed lunch.

Nutrition during Adolescence

Changes in growth and development, hormonal influences and changes, Menarche - factors affecting menarche, psychological problems, and body image, eating disorders, behaviour, and nutritional problems, and planning a menu.

UNIT-V   Nutrition in Adult and Elderly

Nutrition and work efficiency, Premenstrual Syndrome, Menopausal and Post Menopausal complications and treatment, hormonal changes, nutritional requirements, and menu planning .

Physiological changes in ageing - Psycho-social and economic factors, factors influencing eating behaviour, social situation, knowledge and belief, institutionalization, common health problems, nutritional requirements, and diet modification.

REFERENCES:

1. Melvin H. Williams., Nutrition for health fitness & Sport. 5th edition Mcgraw –Hill, publishing Co., 1999.

2. Judith E. Brown., Nutrition Now, 2nd edition, West / Wadswroth west / Wadsworth, An International Thomson publishing company, 1998.

3. Swaminathan,M. Advanced text book on Food and Nutrition, , Anmol Publication Pvt,Ltd, Second Edition.2004.

4. Gopal,C.Kamalakrishnaswamy, Nutrition in Major Metabolic Disease, Oxford India Paper backs Publisher First Edition 2000.

5. H.P.S. Sachdev, Anna choudhry., Nutrition in children- Developing country concerns N.I. Publications Pvt. Ltd, New Delhi, 2004.

6. Sumati. R. Mudambi, M.V Rajagopal., Fundamentals of Foods & Nutrition, 4th Edition New age International publishers New Delhi, 2006.

7. Srilakshmi, B. Nutrition Science, New Age International [p] ltd, New Delhi, 2002.

8. Bahasahe and B. Dosa, Hand book of nutrition and diet.

9. Venkataiah S.D.,Nutrition Education, Anmol Publication Pvt. Ltd, Revised 2004.

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PAPER – 4
FOOD MICROBIOLOGY

OBJECTIVES:

Enable the students:

- To learn about the morphology of different microorganisms.
- To study the food spoilage caused by microorganism
- To understand the various types of poisoning and infection caused by microorganism.

UNIT-I

Types and classification of microorganism, role and significance of micro-organisms in foods, morphology of yeast, mould, bacteria, virus, algae and protozoa.

UNIT-II

Micro-organisms and food: Primary sources in foods, cultural characteristics, biochemical activities. Airborne bacteria, fungi ,microorganisms in soil, normal flora of skin, nose, throat, GI tract

UNIT-III

Food in relation to disease - food born diseases, food infection, intoxication, microbial toxins - types, bacterial poisoning and infection - causative agents and sources , symptoms and prevention of staphylococcal food poisoning, botulism, salmonella, bacillus infection, E.coli, food poisoning of fungal origin - ergotism, aflatoxin .

UNIT-IV

Control of microorganism - Principles of preservation, General principles underlying spoilage of foods. Preservation by high and low temperature, chemical preservatives, salt, sugar as preservative, new trends in preservation.

UNIT-V

Sterilization by physical agents - Heat, moist heat, fractional sterilization, pasteurization, other types of sterilization, chemical sterilization . Microbiology of water, typical organisms in water, types of bacterial examination for water, water treatment.

REFERENCES:

1. Pelczar, M.I and Reid, R.D, Microbiology, MC Graw Hill Book Company, New York,5th edition, 1993.

2. Atlas M.Ronalds , Priniciples of microbiology, 1st edition, Mosby – year book Inc, Missouri, U.S.A, 1995.

3. Frazier, W.C, Food Microbiology, MC Graw Hill Inc 4th edition, 1988.

4. Banwart , Basic Food Microbiology, 2nd edition CBS Publisher, 1989.

5. Bensaon, H.J, Microbiological applications, C. Brown publishers, U.S.A, 1990.

MAIN PRACTICAL -I

ADVANCED FOOD SCIENCE & NUTRTION FOR HEALTH

ADVANCED FOOD SCIENCE

1. Cereal cookery - Preparation of rice based products - Idli, Dosai, Appam - study the effect of fermentation and soaking.
2. Preparation of wheat based products - Chappathi, Phulkas, Poories - with different proportion of wheat flour - study the development of gluten.
3. Pulse cookery - Effects of soaking, acid , alkali and sprouting and different methods of cooking - cooking time and quality of pulses.
4. Vegetable cookery - Effect of acid, alkali and methods of cooking on pigments.
5. Egg, meat, fish, poultry - Methods of cooking on acceptability of the various fleshy foods- foam formation - factors affecting foam formation- Special effect on colour and - tenderness.
6. Fats and oils - Smoking point of different fats and oils - Determination of best frying temperature for different oils- factors affecting fat absorption.
7. Sugar cookery - Stages of sugar cookery, use of sugar in Indian recipes.-Crystallization and factors affecting crystallization.

NUTRITION FOR HEALTH

Menu planning, Preparation and Presentation for the following
- Pregnancy
- Lactation
- Infants
- Pre-schoolers
- School going children
- Adolescence
- Adult of different working category
- Old age
- Sports person
- Sea voyage people
- Person working in space

ELECTIVE-I

FUNCTIONAL FOODS AND NUTRACEUTICALS

OBJECTIVES

To enable the students to

- Understand the relationship between Functional foods and Nutraceuticals.

- Impart knowledge on the role of Functional foods and Nutraceuticals in health and in diseases.

UNIT - I

Functional foods – Definition, concept, evolution of functional food market, types of foods categorized as functional foods, health benefits of functional foods and future promises in Indian diet, research frontiers in functional foods.

Nutraceuticals – Definition, teleology, classification based on food source and mechanism of action, nutraceuticals bridging the gap between food and drug, application of nutraceuticals in Indian and International market, future prospects of nutraceuticals.

UNIT- II

Phytochemicals– Definition, classification with food sources– I. Terpenoids II. Carotenoids III. PolyPhenols; IV. Sulphur containing compounds, significance and effect of phytochemicals on health and in managing diseases.

Antioxidants – Definition, classification, food sources, mechanism of action, health benefits and role of Endogenous antioxidants in protecting cell and Exogenous antioxidants in preventing diseases.

UNIT- III

Probiotics – Definition, types, relevance and concept, role of probiotics in gastro intestinal health and other health benefits, recent advances in probiotics - Lactobacillus and Bifidobacterium.

Prebiotics – Definition, types, effect prebiotics on gut microflora and other health benefits, recent advances in prebiotics – galacto-oligosaccharides (GOS), functional disaccharides (lactulose, lactiol and lactose) and resistant starch (RS).

Symbiotics- role of symbiotics and synbiotics in human health promotion.

UNIT – IV

Dietary supplements – Concept, significance of dietary supplements from plant, animal and microbial sources, relevant studies on animals and humans in management of diseases with special reference to - diabetes mellitus, hypertension, CVD, cancer; Food as remedy for disorders - arthritis, bronchitis, osteoporosis, gastric ulcer, circulatory problems, nephrological conditions, liver disorders, and skin diseases. FOSHU foods for healthier life.

UNIT – V
Regulatory aspects- Safety, adverse effects and toxicity of functional and nutraceuticals food products, International and national regulatory aspects, issues and challenges, ICMR guidelines for Probiotics.

REFERENCES
1. Dilip Ghosh, (2012), Innovation in Healthy and Functional Foods, CRC Press.
2. Yashwant Vishnupant Pathak, (2011), Hand Book of Nutraceuticals, Volume II, CRC New Delhi.
3. Webb G.P (2006), Dietary Supplements and Functional Foods, Blackwell Publishing.
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5. Tamine. A (2005), Probiotic Dairy Products, Blackwell Publishing Ltd, United Kingdom.
6. USFDA regulations on functional foods.
7. Bamji (2003), Textbook of Human Nutrition, 3rd edition, Oxford & IBH Publishing Co Pvt Ltd, New Delhi.

Journals
1. Journal of nutraceuticals, functional and Medical foods.
2. Nutraceutical World.
3. European Journal of Nutraceuticals and Functional Foods.

SEMESTER II

PAPER - 5

ADVANCED NUTRITION - I

OBJECTIVES

Enable the students :
    To understand the importance of nutrients on health and wellbeing.
    To study the functions and metabolic role of nutrients.
    To stay updated with emerging concepts in nutrition.

UNIT – I

Energy - Energy content of foods, energy measurements - direct and indirect calorimetry, components of energy expenditure - BMR, RMR, physical activity, thermic effect of food, thermogenesis. Energy utilization in cells. Energy balance and control of body weight.

UNIT – II

Carbohydrates - Classification, digestion, absorption and utilization of carbohydrates, physiological functions and nutritional role of carbohydrates. Glycemic index and glycemic load. Dietary fiber- types, resistant starch, fructo- oligosaccharides and other oligosaccharides, physiological significance and role of dietary fiber in therapeutic nutrition.

UNIT - III

Lipids – Classification of fats and fatty acids, digestion and absorption of fats, transport of lipids in blood, lipid transformation in the liver, deposition of fats in the body. Lipotropic factors and nutritional importance of EFA, SFA, MUFA, PUFA.

UNIT -IV

Proteins – Classification of proteins and amino acids, digestion and absorption of proteins, amino acid pool and distribution, protein synthesis and turnover of proteins in the body. Protein requirements – factorial and balance methods. Assessment of protein quality – biologic assays and scoring systems.

UNIT - V

Body composition and water balance – levels of body composition, body fluids – composition, osmolar regulation, routes of fluid and electrolyte loss, types of dehydration and principles of fluid therapy. Water balance - body water compartments, regulation of water balance, disorders of water balance.

REFERENCES :

1. Shils, M.E., Olson, J., Shike, M. and Roos, C (2003). Modern Nutrition in Health and Disease, 9" edition Williams and Williams.A Beverly Co. London.

2. Bodwell, C.E..and Erdman, J.W. (2008) Nutrient Interactions. Marcel Dekker Inc. New York.

3. Sareen, S, James, J (2005). Advanced Nutrition in Human Metabolism, 4th Edition, Thomson Wordsworth Publication, USA.

4. Chandra, R.K. (eds) (2002): Nutrition and Immunology, ARTS Biomedical. St. John's Newfoundland.

5.Antia. F.P and Philip Abraham, 2002, "Clinical Dietetics and Nutrition, Oxford University Press.

6. James L.Groff and Sareen S. Gropper, 1999, Advanced Nutrition and Human metabolism, wadsworth/ Thomson Learning.

7.Garrow, J.S. James, W.P.T and Ralph, A., 2000, "Human Nutrition and Dietetics", Churchil Living stone, Edinburgh.

PAPER – 6

ADVANCED NUTRITION - II

OBJECTIVES

Enable the students :

To understand the role of micro-nutrients and their relationship to human health.

To study the health problems associated with micro nutrient deficiencies/ toxicity.

UNIT – I Macro Minerals

Calcium - Functions and mechanisms of action, absorption and factors affecting absorption, utilization, sources, bioavailability and deficiency. **Phosphorus -** Functions and mechanisms of action, absorption, utilization, sources and deficiency.

Inter-relationship between parathormone and vitamin D in the regulation of calcium and phosphorous metabolism.

Magnesium, Sodium, Potassium, Chloride - Functions and mechanisms of action, deficiency and toxicity.

Outline of the above minerals on assessment of nutriture.

UNIT – II Micro Minerals

Iron – Functions and mechanisms of action, absorption, transport, utilization and storage of iron. Sources, bioavailability, role of iron in prevention of anaemia and assessment of nutriture.

Iodine – Functions and mechanisms of action, absorption, uptake of iodine by the thyroid gland, sources and gotirogens, deficiency and assessment of nutriture.

Zinc, Copper, Selenium, Chromium and Fluorine - Functions and mechanisms of action, food sources, deficiency/toxicity.

UNIT III Fat Soluble Vitamins

Vitamin – A, D, E and K - History, functions and mechanisms of action, metabolism, storage and excretion. Sources, deficiency, toxicity and assessment of nutriture.

UNIT IV Water Soluble Vitamins

Energy releasing B Vitamins -Vitamin B1 (Thiamin), Vitamin B2 (Riboflavin), Vitamin B3 (Niacin), Vitamin B6 (Pyridoxine), Pantothenic acid and Biotin – Physiological and biochemical functions, sources and deficiency.

Hematopoietic B Vitamins - Folic acid, Vitamin B12 (Cobalamin) – physiological and biochemical functions, sources and deficiency.

Vitamin C (Ascorbic acid) –History, functions and mechanisms of action, role of Vitamin C in diseases, deficiency and toxicity, assessment of nutriture.

UNIT V Health Effects of Micronutrients

Vitamin like molecules – Role of Choline, Carnitine, Inositol, Taurine, Pangamate Laetrile and PABA in human health.

Heavy metal toxicity and their harmful effect to health.

Interdependence of minerals and vitamins in human nutrition.

REFERENCES :

1. James L. Groff and Sareen S. Gropper. (2000). Advanced nutrition and human metabolism. 3rd Edition, Wadsworth/Thomson Learning.
2. Shills, M.E., Olson, J. Shike, M. and Roos, C. (2003). Modern nutrition in health and disease. 9th edition, Williams and Williams. A Beverly Co. London.
3. Gibson R.S. (2005). Principles of Nutritional Assessment. 2nd Ed. Oxford University Press.
4. Sareen, S, James, J. (2005). Advanced nutrition in human metabolism. 4th Edition, Thomson Wordsworth Publication, USA.
5. Bamji M.S., Rao N.P., Reddy V. Eds. (2009). Textbook of Human Nutrition. 3rd Edition. Oxford and IBH Publishing Co. Pvt. Ltd.

PAPER - 7

RESEARCH METHODOLOGY AND STATISTICS

OBJECTIVES:

To enable the students to:

- Understand the fundamental principles and techniques of research
- Learn about the application of statistical procedure in research
- Familiarize on writing the project report

UNIT I Introduction to Research

Definition, Objectives, Characteristics and types of research – Basic, applied, action, evaluation and experimental-preclinical and clinical studies (human intervention trials). Research design in nutrition. Surveys –Descriptive, diagnostic and exploratory. Defining and determining the research problem. Ethical issues – Regulations and guidelines for human subjects, Informed consent.

UNIT II Data Collection and Sampling design

Primary and secondary data-Data sources. Preparation of interview schedules and questionnaires. Observation, Interview method of enquiry, Training of interviewers, Pre-testing and pilot study. Processing of data –editing and coding.

Sampling- Selection of samples, Size of sample, Different sampling designs -probability and non probability sampling methods. Merits and Demerits of sampling method.

UNIT III Organisation, Representation of data and Report writing

Classification - Qualitative, Quantitative-frequency distribution, discrete and continuous. Tabulation of data- Parts of a table, preparation of blank tables.

Representation of data-Diagrammatic- one dimensional and two dimensional diagrams, pictograms and cartograms.

Writing a research report –format of thesis writing with example.

UNIT IV Descriptive Measures

Measures of central tendency- Mean, Median and Mode and their application. Measures of Dispersion – Mean deviation, Standard deviation , Quartile deviation, Coefficient of variation, Percentile, Association of attributes, Correlation coefficient and its interpretation, Rank correlation, Regression equations and prediction, Contingency table.

UNIT V Probability and Tests of Significance

Rules of probability and its application, Normal and binomial distributions in studies,

Test of significance-Large and small sample tests- "t", F and chi square tests and ANOVA applications.

References:

1. Devadas. R.P. A Handbook on methodology of Research, Sri Ramakrishna Vidyalaya, Coimbatore, 2000.

2. Kothari. G.R.Research Methodology, Methods and Techniques, Wiley Eastern limited, New Delhi, 2006.

3. Gupta.S.P.Statistical Methods, Sultan Chand & Sons,New Delhi,2002.

4. Srivastava A.B.L and Sharma. K.K., Elementary Statistics in Psychology and Education, Sterling publishers Pvt .ltd.2003.

5.Kulbir Singh Sidhu, Methodology of research in Education Sterling Publishers Pvt Ltd,New delhi,2006.

6.Gosh .B.N. Scientific Methods and Social Research Sterling Publishers Pvt .Ltd, New Delhi.

MAIN PRACTICAL - II

FOOD ANALYSIS

A. QUALITATIVE TESTS:
1. Reactions of sugars and their identification in unknown mixtures.
2. Tests for proteins and their identification in unknown mixtures.
3. Tests for lipids – glycerol, cholesterol and unsaturated fatty acids.
4. Qualitative tests for carbohydrates, protein and lipids in food stuffs.

B. ANALYSIS OF FOOD:
5. Moisture
6. Ash
7. Fiber
8. Calcium
9. Iron
10. Phosphorus
11. Ascorbic acid
12. Total antioxidants.

ELECTIVE II

PAPER -2 NUTRIGENOMICS

OBJECTIVES:-

- Aim to understand in depth the influence of genetics on micronutrient metabolism.
- It helps in implicating the determination and prevention of human inherited inborn diseases.

Unit-I:

Introduction to Nutrigenomics

Definition, concepts of Functional Genomics, Personalized Nutrition - Concepts, types and recent trends over it. Recent developments and future frontiers in Nutrigenomics.

Unit-ll
Nutrigenomics and Pharmacogenomics
Overview of Nutrigenomics, Inter -relationship and Applications of Nutrigenomics and Pharmacogenomics, Traditional medicine based on Pharmacogenomics, Toxicogenomics - Definition, causes,principles and applications.

Unit-III
Diet and gene expression

Diet and Epigenetics, Shorterm gene expression regulated by factors such as Nucleic acid, protein data bases and nutrient data bases.

Unit-IV
Perinatal programming
Diet in early life and Metabolic programming, Perinatal programming-applications, Myths facts and future Research.

UNIT-V

Genetics in Human Nutrition

Interactions of micronutrients with human diseases (Diabetes, CVD, Cancer, Obesity, Osteoporosis and Neuro degenerative diseases). Role of genetics in Human Nutrient Metabolism.

References:

1. Arkadianos I, Valdes AM, Marinos E, Florou A, Gill RD, Grimaldi KA. "Improved weight management using genetic information to personalize a calorie controlled diet". Nutrition Journal. 2007;18(6):29. [PMC free article] [PubMed]
2. Bakshi N, Morris CR." The role of the arginine metabolome in pain:" Implications for sickle cell disease". Journal of Pain Research. "2016;9:167–175. [PMC free article] [PubMed]
3. EFSA (European Food Safety Authority). "Scientific opinion on establishing food-based dietary guidelines". EFSA Journal. 2010;8 (3):1460. [PubMed]
4. FDA (U.S. Food and Drug Administration). "The public health evidence for FDA oversight of laboratory developed tests": 20 case studies. 2015. [January 27, 2018]. https://www.fda.gov/MedicalDevices/ProductsandMedicalProcedures /InVitroDiagnostics/LaboratoryDevelopedTests/default.htm.
5. FDA. "Use of real-world evidence to support regulatory decision-making for medical devices", [January 26, 2018]. https://www.fda.gov/downloads /MedicalDevices/DeviceRegulationandGuidance/GuidanceDocuments /UCM513027.pdf.
6. FDA." Medical foods guidance documents and regulatory information". https://www.fda.gov/Food/GuidanceRegulation /GuidanceDocumentsRegulatoryInformation/MedicalFoods/default.htm.

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2

HUMAN RIGHTS

(Compulsory paper for all PG Degree courses)

Unit: I

Theories on Human Rights - Definition – Classification - Characteristic of Human Rights - Historical Development of Human Rights.

Unit: II

Human Rights and U.N.O - Universal declaration of Human Rights - International Covenant on Civil and Political Rights, 1966 - International Covenant on Economic, Social and Culture Rights - Optional Protocol.

Unit: III

Constitutional Guarantee on Human Rights in India - Fundamental Rights - Directive Principles of State Policy – National Human Rights Commission - State Human Rights Commission.

Unit: IV

Human Rights and International Organisations – Amnesty International – Helsinki process – Asia watch – European Human Rights System – African Human Rights – Hot-line.

Unit: V

Contemporary Issues on Human Rights – Bonded Labour – Child Labour – Refugees – Capital Punishment – Women's Rights – Children's Rights.

Books for Reference:-

1. International Bill of Human Rights, Amnesty International Publication, 1988.
2. Human Rights, Questions and Answers, UNESCO, 1982.
3. A.R. Desai – Violation of Democratic Rights in India.
4. Pandey Constitutional Law.
5. K.S. Singh – Indian Social Institution.

SEMESTER III
PAPER -8
DIET THERAPY- 1

OBJECTIVES : To enable the students to:

- Understand the role of nutrition for good health.
- Obtain knowledge of different therapeutic diet and their preparation
- Develop, capacity and attitude for taking up the profession as dietician

Unit I Introduction to diet therapy

Definition, history, growth and scope of dietetics, characteristics, role of dietitians and IDA . Team approach in patient care. Dietetics in modern health care management. Purpose, principles and classification of therapeutic diets, Modification of normal diet, Enteral and Parenteral nutrition-Types, formula composition, advantages and disadvantages. Pre and post operative nutrition.

Unit II Guidelines for dietary planning and procedure

Weights and Measures, Determining nutritional needs, Basic guidelines for diet planning, Nutritional status of Indians, Cultural aspects of dietary Planning. Identification of high risk patients- nutritional assessment, nutritional diagnosis, nutrition intervention, monitoring and evaluation of nutritional care. Assessment components-medical and nutritional care record types and uses, Format for medical and nutrition charting and documentation .

Unit III   Nutrition counseling:

Concept, recipient and counseling environment, Problem solving counseling method. Activities for behavior changes, intervention counselling models, types of counseling session in patients. Empowerment, interpersonal skills. Nutritional counseling components – planning, implementation and evaluation.

Unit IV   Diet in Endocrine disorders, Fever and Infections

Diabetes mellitus: Etiology, types, clinical and biochemical changes, Clinical signs and symptoms, complications, diagnosis, mode of treatments. Disorders of thyroid and para thyroid glands, tetany, gout and arthritis. **Obesity :** Etiology, theories on Obesity, types, Dietary modification, complications. **Under weight:** Etiology, Dietary modification. **Fevers-** causes, types, metabolic changes, fevers of short duration and chronic fever and infections.

Unit V   Diet in Diseases of the gastrointestinal tract

Gastrointestinal tract- Etiology, type, clinical signs and symptoms, diagnosis, diet modifications- peptic ulcer, diarrhoea, dysentery, constipation, gastritis, tropical sprue

dumping syndrome, lactose intolerance, malabsorption and irritable bowel syndrome, diverticulosis and diverticulosis .

References:

1. Robinson C.H. (2007) Normal and Therapeutic nutrition, 12th edition, Mac millan Publishing Co. Inc, Newyork.
2. Krause M.V and Mahan L.K (2010) Food, Nutrition and Diet therapy, 9th edition, W.B. Saunder Co, Philadeephia
3. Srilakshmi. B (2012), Dietetics, New Age International Pvt Ltd, New Delhi.
4. Dietary Guidelines of Indians- A Manual, National Institute of Nutrtition, Hyderabad, 2006.
5. 5. Swaminathan M. Essentials of Food and Nutrition, Vol. I & II Ganesh and Company, Madras, 1974.
6.

Journals:

1. Journal of American Dietetic Association. The American Dietetic Association Mount Arris, Illinois-61054, USA.
2. The American Journal of Clinical Nutrition Published by the American society for Clinical Nutrition, Inc., USA.
3. The Indian Journal of Nutrition and Dietetics, Sri Avinashilingam Home Science College for Women, Coimbatore.
4. Clinical Nutrition, Bell and Bain Ltd., Scotland.
5. Food and Nutrition Bulletin, United Nations University Press, Japan
6. Clinical Nutrition, Sales Promotion, Department, Churchill Livingstone Medical
7. Journals Robers Stevenson House 1-3, Baxter's place, Edinburgh EHI, EAF.UK.
8. 13. The British Journal of Nutrition, Cambridge Univerasity, Press Journals Dept. 46
9. West 20th Street, New York, 10011-4211.

PAPER -9
DIET THERAPY -2

OBJECTIVES :

To enable the students to:
- Understand the principles of diet and nutrition in the cause and treatment of disease.
- Understand the modifications in nutrients and diet for therapeutic condition.
- Learn recent concepts in dietary management of different diseases.

Unit I Diet in Diseases of liver

Functions of liver, etiology, physiological and metabolic consequences, clinical signs and symptoms, mode of treatment and diet modifications of jaundice, hepatitis, cirrhosis, hepatic coma, cholecystitis, cholelithiasis and pancreatitis.

Unit II Diet in Diseases of cardio vascular system

Etiology, Symptoms, Risk factors of CVD, Role of fat in the development and prevention of atherosclerosis and dietary management of atherosclerosis, Ischemic heart disease, dislipidemia, prevention through life style modifications. Hypertension - Classification, prevalence, diet related factors influencing hypertension, dietary management of hypertension**.**

Unit III   Diseases of renal system

Function of kidney, etiology, physiological and metabolic consequences, clinical signs and symptoms and diet modification for Nephritis, Nephrosis. Nephrosclerosis, acute &chronic renal failure - Dialysis: principles and procedure. Renal calculi- etiology, types, dietary modification.

Unit IV Diet in pulmonary disease and cancer

Pulmonary diseases : Bronco pulmonary disease, asthma, respiratory failure.
Cancer : Classification, risk factors, symptoms, general systemic reactions, nutritional problems of cancer therapy, nutritional requirement and diet modifications

Unit V Diets in other disease conditions

HIV and AIDS- Etiology, signs and symptoms, stages, diagnosis and diet modifications

Allergy- definition, classification, manifestation, common food allergies, tests for allergy and diet modification

Surgery - Physiological response, Metabolic Consequences, Stage of Convalescence, pre and post operative diets.

Burns - Metabolic changes in protein and electrolytes and Nutritional support.

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8. Gopalan , C. Ramasastri, B.V. and Balasubramaniam, S.C. Nutritive value of Indian Foods National Institute of Nutrition, Hyderbad 7, 1994.

Journal

1. Journal of American Dietetics Association
2. Indian Journal of Medical Research
3. Indian Journal of Nutrition and Dietetics
4. Nutrition Reviews
5. American Journal of Clinical Nutrtion
6. Applied Nutrition, Journal of Indian Dietetics Association Pub. Secretary of Indian Dietic Association 27/1 Monoharpuku, Calcutta 700 029.

PAPER -10

BIOCHEMICAL BASIS OF NUTRITION

OBJECTIVES:
To enable students
1. Understand the Biochemical and physiological impairments in diseases:
2. Develop skills to analyze selected constituents in blood and urine during diseases:

Unit I

Basis for biochemical estimation- basic principles - general lab information - units of measure. Uses of biochemical data in clinical medicine. Acquisition and interpretation of biochemical data.

Unit II

Maintenance of Normoglycaemia – Normal Glucose metabolism - glucose transporters - Glucose transporter, Disorders of carbohydrate metabolism proteins - insulin - Biosynthesis, secretion, kinetics and action. Abnormalities of, insulin synthesis and Secretion.
Diabetes mellitus - definition , classification of diabetes - in detail. Long term diabetic complications, management of diabetes mellitus.
Fat metabolism - lipids - types. Lipoprotein - types, metabolism - exogenous pathway, endogenous pathway.
Lipoprotein disorders – primary dyslipoproteinaemics, acquired, Hyperlipididaemia, acquired hypolipidaemia.

Unit III

Clinical biochemistry of nutrition, nutritional requirements - carbohydrate, protein fat, vitamins, minerals. Malabsorption- carbohydrate absorption, protein absorption fat absorption, diarrhoea, its course.Anatomy of liver Hepatic regeneration, physiological function, liver function test and its uses.Poisoning - etiology of poisoning, Diagnosis and management of poisoning Specific poisons.

Unit IV

Anatomy of kidney - gross anatomy and microstructure renal function. Renal diseases and its presentation. Assessment of renal function. Renal Failure - acute and chronic, metabolic Consequences and management of renal . Mechanism of protein conservation by the kidney - urine protein content in health - Proteinuria in renal diseases -Proteinuria in non renal diseases. Renal tubular disorders, renal calculi.

Unit V

Blood - components, function, RBC - structure, function and metabolism, Hemolysis – definition, classification and consequences . Biosynthesis of haem porphyries and its genetics classification . Hemoglobinopathies, structure and function of hemoglobin ,

control of hemoglobin synthesis. Thalasaemias - α and β. Structural Hemoglobin variants SCA.

References

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MAIN PRACTICAL
PRACTICAL-3
DIET THERAPY-1 & 2

Diet Therapy 1

1. Practical experience in weighing and measuring food items
2. Different types of diet - Full liquid, clear liquid, soft, light, bland and regular diet.
3. Diet for - obesity, underweight, febrile conditions.
4. Diet in gastro intestinal disorders - peptic ulcer, diarrhoea, constipation.
5. Diet in Diabetes mellitus - Insulin dependent diabetic mellitus, non- insulin dependent diabetes mellitus, diabetes with complications
6. Visit to a hospital to observe - Enteral Feeding and formula diet for tube feeding.

Diet Therapy 2

1. Diet in liver disorders - jaundice, hepatitis, cirrhosis, hepatic coma, fatty liver and gall stones.
2. Diet in Cardio vascular disease - Hypertension, atherosclerosis, congestive heart failure.
3. Diet in kidney disorders - Glomerulo nephritis, nephritic syndrome, renal failure, and urolithiasis.
4. Diet in disease of pulmonary diseases –Bronchitis, Asthma and acute and chronic respiratory failure
5. Diet in disease of cancer-Oral, breast, stomach, uterus and colon cancer.
6. Case study-Selecting and observing one patient requiring a therapeutic diet in relation to
7. Patient's dietary history - income, occupation, food habits and social factors.
8. Use of the computer in diet, Counselling and patient education-Preparation of a diet chart

Elective III

PAPER -3

FOOD PROCESSING AND PRESERVATION

OBJECTIVES

To enable the students,

- To understand the basic concept, functions & classification of food.
- To understand the basic principles involved in Preservation and processing techniques

Unit-I

Introduction to food science, concepts of processing, and preservation. Different methods of new processing and preservation techniques used in modern food industry.

Unit-II

Cereals Structure, composition, cereal cookery: Gelatinization, Dextrinization. Processing and Preservation of cereals (Rice, wheat and millets), Processed cereals products,and Ready to eat cereals used in cooking.

Unit-III

Pulses and legumes -Definition, composition, structure of pulses, cooking of legumes and factors affecting cooking time of pulses and legumes. Use of legumes in cookery.Processing and different Preservation methods used for pulses, role of antioxidants activity in pulses.

Unit-IV

Fruits and vegetables- processing , drying and dehydration techniques, canning and freezing. Sugarcane and sago technology - processing and by products utilization.

Dairy Technology- Milk processing, separation, standardization, pasteurization, homogenization, sterilization- Ultra High Temperature (UHT), Sterile milk and milk products, butter, cream and ghee. Fleshy Foods Technology- Meat, Poultry, Fish and Egg Processing and Preservation.

UNIT-V

Oil seed Technology- Extraction of oils, meal concentrates and isolates. Spice technology - Processing, Extraction of essential oils and colours.

Confectionary technology- types of confectionaries and its methods of processing and preservation

References:

1. NIIR Board of Food and Technologist, Modern Technology of Food Processing and Agro based industries, National Institute of Industrial Research, Delhi, 2005.
2. Peter zeuthena nd Leif Bogh- Sorensen, Food Preservation Techniques, Wood Head Publishing Ltd., Cambridge, England, 2005

3. Suman Bhatti, Uma Varma, Fruit and vegetable processing organizations and institutions, CBS Publishing, New Delhi, 1st Ediion- 1995.

4. Mirdula Mirajkar, Sreelatha Menon, Food Science and Processing Technology vol-2, Commercial processing and packaging, Kanishka publishers, New Delhi- 2002.

5. NIIR Board, the complete Technology book on processing, dehydration, canning, preservation of fruits and vegetables, National Institute of Industrial Research, Delhi- 2005.

SEMESTER IV

PAPER -11

COMMUNITY AND PUBLIC HEALTH NUTRITION

OBJECTIVES
To enable the students,
- Gain insight into the national nutritional problems and their implications and appreciate the nutritional and international contribution towards nutrition improvement in India.
- Gain knowledge and skills to use computers in the study of nutrition
- Organize and conduct nutrition education in the community.

Unit I

Nutrition and National Development, Ecology of Malnutrition, Strategies to Overcome Malnutrition

Relation of nutrition to national development, nutrition and food security; Consequences of malnutrition; IMR, NMR,MMR and prevalence of common nutritional problems- PEM, Vitamin A Deficiency Diseases, Anaemia, Iodine Deficiency Disorders and Fluorosis, Ecological factors leading to malnutrition; Synergism between malnutrition and infection; Measures to overcome malnutrition. Nutrition Intervention programmes - Nutritious Noon Meal Programme. ICDS, Prophylaxis programme – Vitamin A deficiency, Iron deficiency anaemia, Iodine deficiency, National Nutrition policy. Empowering women towards improving the nutritional status of the family, community and nation at large.

Unit II

National, International and Voluntary Organizations to Combat Malnutrition, History of malnutrition in India

National organization – ICAR, ICMR, SCWB, SSWB, NNMB, NIN, CFTRI, DFRL, NIPCCID and NFI; International Organizations - WHO, FAO, UNICEF, World Bank, FFHC, WFP; Voluntary organizations – Global Alliance for Improved Nutrition(GAIN), Micronutrient Initiatives, CARE, CRS, AFPRO, IDA; Concepts of Community Health ,Health care of the community.

Unit III

Nutrition Education-Meaning, nature and importance of Nutrition education to the community and lessons to be taught

Training workers in nutrition education programmes Methods of education when to teach, whom to teach Use of computers to impart nutrition education, Organization of Nutrition education programmes.

Unit IV
Epidemiology of Communicable Diseases

Definition of epidemiology - causes, signs and symptoms, treatment and prevention of communicable diseases, respiratory infections, intestinal infections, Other infections-dengue, filariasis. Types of immunity- active, passive and herd-group protection Immunization agents- vaccines, immunoglobulin, Immunization schedules (SS) - Active-National and WHO Expanded Programme on Immunization- Universal Passive, Combined, Chemoprophylaxis, non-specific measures.

Unit V

Environmental Sanitation And Disaster Management
Pollution, Bio manure, Vermi composting, Effective Microorganisms, Water purification and recycling, Types of disaster - natural and manmade –earthquakes, volcanic eruptions, flash foods, major floods, tsunami and drought, fire accidents , bomb blast. Disaster management-mitigation strategies-Role of NGO's and GO's and nutritionists. Prevention, warning systems and relief, Major nutritional and health considerations in disaster Emergency feeding ,mass and supplementary feedings ,management of feeding operations ,water and food safety.

References:

1. Park A. (2007), Park's Textbook of Preventive and Social Medicine XIX Edition M/S Banarasidas, Bharat Publishers, 1167, Prem Nagar, Jabalpur, 428 001(India)
2. Bamji M.S, Prahlad Rao N, Reddy V (2004). Textbook of Human Nutrition II Edition, Oxford and PBH Publishing Co. Pvt. Ltd , New Delhi
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5. Swaminathan M (2007), Essentials of Food and Nutrition. An Advanced Textbook Vol.I, The Bangalore Printing and Publishing Co. Ltd, Bangalore

Journals:

1. Reports of the State of World's Children, WHO and UNICEF, Oxford University.
2. Reports of National Family Health Survey, International Institute for Population Science, Mumbai.
3. Indian Journal of Medical Research, ICMR, New Delhi,
4. Indian Journal of Pediatrics, Valley Nicro, Missouri, U.P.
5. Indian Journal of Nutrition and Dietetics, Avinashilingam Deemed University, Coimbatore.
6. Proceedings of the Nutrition Society of India, NSI, Hyderabad.

PAPER-12

FOOD STANDARDS AND QUALITY CONTROL

Objectives:

- To know the importance of quality control and quality assurance in food industry.
- To know the tests and standards for quality assessment of food
- To know the laws and standards ensuring food quality and safety

UNIT-I: INTRODUCTION OF QUALITY CONTROL

Definition, scope and significance of quality control. Principles of quality control. Quality attributes of Food – Nutritional, microbial and sensory quality. Quality assurance - Quality assurance in Food Services System, Quality control vs Quality assurance.

UNIT-II: EVALUATION OF QUALITY OF FOODS

Sensory Evaluation of foods – Subjective and objective methods of evaluation of food. Types of test, limitation of sensory evaluation. Improvised instruments used for Indian recipes.

UNIT-III: FOOD ADDITIVES

Definitions, classification and function, Natural and synthetic origin of additives, preservatives, antioxidants, colours and flavours, emulsifiers, sweeteners, buffering salts, anti caking agents. Toxicological evaluation of food additives.

UNIT-IV: FOOD ADULTERATION

Definition, reasons for food adulteration, methods of adulteration, and methods of detection. Consumer's responsibilities, consumer organizations. The prevention of food adulteration Act, The consumer protection Act.

UNIT- V: FOOD STANDARDS AND FOOD LAWS

Food laws and standards -Concept, need and its importance. National food legislation such as FSSA, Essential Commodities Act, ISI or BIS, AGMARK,FPO International Organization implementing food standards- FAO, FDA, Codex Alimentarius, ISO 22000 series, WHO and APEDA. HACCP.

References:

1. Early, R. Guide to Quality Management Systems for the Food Industry, Blackie,Academic and Professional, London
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6. Hagstad, H.V. and Hubbert, W.T. Food Quality Control, Foods of Animal Origin, Lowa State University Press, AMES
7. Srilakshmi, B. Food Science, New Age International (P) Ltd., Publishers, New Delhi.

ELECTIVE 4

PAPER -4
FOOD BIOTECHNOLOGY

OBJECTIVES
To enable the students,

- Understand the application of biotechnology in the field of foods and nutrition.
- Create interest in related activities of tissue culture and fermentation technology.
- Learn the concept of xenobiotics and nanotechnology.

Unit I

Definition and importance of biotechnology. Genetic Engineering: Enzymes as tools – Exonucleases, Endonucleases, Restriction Endonucleases, Ligases, Reverse Transcriptase and Alkaline Phosphatase. Cloning Vectors – Plasmids, bacteriophage, Cosmids and Phasmids.

Unit II

Fermentation Systems – batch and continuous process, environmental factors, fermenter design. Microbial cell growth, microbial metabolism, regulation of metabolism and product secretion.

Unit III

Plant and animal tissue culture – principles and procedure, culture media, applications. Transgenic plants – Golden rice, BT brinjal, GM mustard, Flavr savr tomato. Production of microbial protein – Single Cell Protein (SCP), Spirulina, Mushroom Culture and yeast biomass production.

Unit IV

Synthesis of citric acid, glucouronic acid, lactic acid. Sweeteners – Glucose syrup and high fructose corn syrup. Vitamins – Vitamin A, Riboflavin, Vitamin B 12 thickeners and gelling agents – xanthan gums. Food fermentations – alcoholic beverages, cheese making, fermented soya based foods, vinegar and meat fermentation.

Unit V

Xenobiotics – Definition, components and metabolism of xenobiotics. Concepts and applications of nanotechnology. Downstream processing, biosensors, biochips, limiting factors and regulation. Safety aspect of foods produced by biotechnology.

References:

1. V.K.Joshi and AshokPandey (2009) Biotechnology: Food fermentation – microbiology, Biochemistry and Technology, volume – I, Asia Tech Publishers, New Delhi.
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3. Meenakshi Paul (2007) Biotechnology and Food Processing Mechanics, Gene – Tech Publishers
4. Ravishankar RAi, V(2015) Advances in Food Biotechnology. Wiley – Blackwell.
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Journals

1. Food Technology, Journal of Institute of Food Technology, Illinosis, USA
2. Food technology, Abstract, Central Food Technological Research Institute(CFTRI), Mysore
3. Trends in Biotechnology, USA.

MAIN PRACTICAL 4

NUTRITIONAL ASSESSMENT AND DIET COUNSELLING

1. Community based project for assessment of nutritional status of any vulnerable group by using
    - Anthropometry
    - Clinical Examination
    - Biochemical
    - Biophysical
    - Diet Survey

2. Practical consideration in giving dietary advice and counselling –
    - Factors affecting and individual food choice.
    - Communication of dietary advice
    - Consideration of behaviour modification
    - Motivation.

3. Preparation of Counselling aids used by dietitians- charts, leaflets, posters etc., preparation of teaching material for patients suffering from Digestive disorders, Hypertension, Diabetes, Atherosclerosis & Hepatitis and cirrhosis.

4. Computer application
    a) Use of computers by dietitian
    b) Dietary computations
    c) Dietetic management
    d) Education/ training
    e) Information storage
    f) Administrations
    g) Research

5. Preparation of case history of a patient and presentation of the report.