

BACHELOR OF SCIENCE MATHEMATICS WITH COMPUTER APPLICATIONS REGULATIONS

ELIGIBILITY

A Candidate for admission to the first year of the **B. Sc. Mathematics with Computer Applications** Degree course shall be required to have passed the higher secondary examination conducted by the Govt. of Tamil Nadu with Mathematics as one of the papers are only eligible or other examinations accepted as equivalent there to by the Academic Council, subject to such other conditions as may be prescribed therefore. Business Mathematics, General Mathematics and Statistics subject at HSC shall not be considered as equivalent to Mathematics.


OBJECTIVE OF THE COURSE

1. To understand the basic rules of logic, including the role of axioms or assumptions
2. To Appreciate the role of mathematical proof in formal deductive reasoning
3. To Proficiently construct logical arguments and rigorous proofs
4. To Formulate and solve abstract mathematical problems
5. To Recognize real-world problems that are amenable to mathematical analysis, and formulate mathematical models of such problems
6. To Apply mathematical methodologies to open-ended real-world problems

SCHEME OF EXAMINATION

Subject Code	Subject	Hrs of Instructi on	Exam Duration (Hrs)	Max Marks			Credit Points
				CA	CE	Total	
First Semester							
Part – I							
15UTL11T 15UHL11H 15UML11M 15UFL11F	Tamil-I Hindi-I/ Malayalam-I/ French – I	6	3	25	75	100	4
Part – II							
15UEG12E	English - I	6	3	25	75	100	4
Part – III							
15UMA13A	Core -I: Classical Algebra	5	3	25	75	100	4
15UMA13B	Core -II: Calculus	5	3	25	75	100	4
15UMA1AA	Allied -I: Statistics – I	6	3	25	75	100	4
Part – IV							
15UFC1FA	Environmental studies	2	3	-	50	50	2
		30				550	22
Second Semester							
Part – I							
15UTL21T 15UHL21H 15UML21M 15UFL21F	Tamil-II/ Hindi-II/ Malayalam-II/ French – II	6	3	25	75	100	4
Part – II							
15UEG22E	English - II	6	3	25	75	100	4
Part – III							
15UMA23A	Core -III: Analytical Geometry	5	3	25	75	100	4
15UMA23B	Core -IV: MS Office	3	3	25	75	100	4
15UMA23P	Core Lab - I : MS Office	2	3	20	30	50	2
15UMA2AA	Allied- II: Statistics – II	6	3	25	75	100	4


BoS Chairman/HoD
Department of Mathematics
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Part – IV							
15UFC2FA	Value Education: Human Rights	2	3	-	50	50	2
		30				600	24
Third Semester							
Part – III							
15UMA33A	Core -V: Trigonometry, Vector Calculus and Fourier Series	5	3	25	75	100	4
15UMA33B	Core -VI : Statics	5	3	25	75	100	4
15UMA33C	Core -VII: Programming in C	4	3	20	55	75	3
15UMA33P	Core Lab – II: Programming in C	2	3	20	30	50	2
15UPA3AA	Allied - III : Business Accounting - I	7	3	25	75	100	4
Part – IV							
	NMEC-I	2	3	-	50	50	2
15UMA3SA	Skill Based Subject –I : Operations Research	3	3	20	55	75	3
15UFC3FA/ 15UFC3FB/ 15UFC3FC/ 15UFC3FD/ 15UFC3FE	Tamil/ Advanced Tamil (or)Yoga for Human Excellence/ Women’s Rights/Constitution of India	2	3	-	50	50	2
		30				600	24
Fourth Semester							
Part – III							
15UMA43A	Core -VIII: Differential Equations and Laplace	5	3	25	75	100	4

	Transforms						
15UMA43B	Core -IX: Dynamics	5	3	25	75	100	4
15UMA43C	Core- X: Programming in C++	4	3	20	55	75	3
15UMA43P	Core Lab – III: Programming in C++	2	3	20	30	50	2
15UPA4AA	Allied - IV : Business Accounting - II	7	3	25	75	100	4
Part – IV							
	NMEC -II	2	3	-	50	50	2
15UMA4SA	Skill Based Subject-II : Operations Research - II	3	3	20	55	75	3
15UFC4FA/ 15UFC4FB/ 15UFC4FC/	Tamil / Advanced Tamil (or)General Awareness	2	3	-	50	50	2
		30				600	24
Fifth Semester							
Part – III							
15UMA53A	Core- XI: Real Analysis	5	3	25	75	100	4
15UMA53B	Core -XII: Modern Algebra	5	3	25	75	100	4
15UMA53C	Core- XIII: Visual Basic	4	3	20	55	75	3
15UMA53D	Core -XIV : Discrete Mathematics	5	3	25	75	100	4
15UMA53P	Core Lab – IV: Visual Basic	2	3	20	30	50	2
	Elective – I	6	3	25	75	100	4
15UMA5SA	Skill based subject- III: Operations Research-III	3	3	20	55	75	3
		30				600	24

Sixth Semester							
Part – III							
12UMA63A	Core- XV: Complex Analysis	6	3	25	75	100	4
12UMA63B	Core -XVI: Internet and Java	5	3	20	55	75	3
12UMA63P	Core Lab - V: Internet and Java	3	3	20	30	50	2
	Elective -II :	6	3	25	75	100	4
	Elective -III :	6	3	25	75	100	4
15UMA6SA	Skill based subject -IV: Quantitative Aptitude	4	3	20	55	75	3
15UEX65A	Extension Activity	-	3	-	50	50	2
		30				550	22
Grand Total						3500	140

ELECTIVE - I

(Student shall select any one of the following subject as Elective in fifth semester)

S.No	Subject Code	Name of the Subject
1	15UMA5EA	Astronomy-I
2	15UMA5EB	Numerical Methods-I
3	15UMA5EC	RDBMS and Oracle

ELECTIVE - II

(Students shall select any one of the following subject as Elective in sixth semester)

S.No	Subject Code	Name of the Subject
1.	15UMA6EA	Astronomy-II
2.	15UMA6EB	Numerical Methods-II
3.	15UMA6EC	Digital Electronics and Computer Fundamentals

ELECTIVE - III

(Students shall select any one of the following subject as Elective in sixth semester)

S.No	Subject Code	Name of the Subject
1.	15UMA6ED	Automata Theory & Formal Languages
2.	15UMA6EE	Fuzzy Logic and Neural Networks
3.	15UMA6EF	Graph Theory

NON MAJOR ELECTIVE COURSES

- The Department offers the following two papers as Non Major Elective Courses for other than the mathematics related students.
- Student shall select any one of the following subject as Non Major Elective Courses during their III and IV semester

S.No	Semester	Subject Code	Name of the Subject
1.	III	15UED34B	Mathematics for Competitive Examinations-I
2.	IV	15UED44B	Mathematics for Competitive Examinations-II

FOR COURSE COMPLETION

Students have to complete the following subjects:

- Language papers (Tamil/Malayalam/French/Hindi, English) in I and II semester.
- Environmental Studies in I semester.
- Value Education in II and III semester respectively.
- General Awareness in IV semester.
- Allied papers in I, II, III and IV semesters.
- Non Major Elective Courses in III and IV semester.
- Elective papers in the fifth and sixth semesters.
- Extension activity in VI semester.

Total Credit Distribution

Subjects	Credits	Total		Credits	Cumulative Total
Part I: Tamil	4	2x 100 =	200	08	16
Part II: English	4	2x 100 =	200	08	
Part III:					
Core	4	12 x 100	1200	48	98
Core	3	4 x 75 =	300	12	
Elective	4	3 x 100 =	300	12	
Core Lab	2	5 x 50 =	250	10	
Allied Theory	4	4 x 100 =	400	16	
Part IV:					
Skill Based Subject Language & Others	3	4 x 75 =	300	12	24
	2	2 x 50 =	100	04	
Value Education	2	1 x 50 =	50	02	
Environmental	2	1 x 50 =	50	02	
NMEC	2	2 x 50 =	100	04	
Part V:					
Extension Activity	2		50	02	02
Total			3500	140	140

15UTL11T	பகுதி -I: தமிழ் தாள்-I	முதல் பருவம்
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Total Credits: 4

Hours Per Week: 6

(ஓர் ஆண்டு தமிழ் பயிலும் மாணவர்களுக்கு உரியது)

முதல் ஆண்டு

இக்காலஇலக்கியம்- நீதி இலக்கியம் – சிற்றிலக்கியம்

அலகு-1 இக்காலஇலக்கியம் (கவிதை,சிறுகதை,உரைநடை)

1. பாரதியார் – எங்கள் தாய்
2. பாரதிதாசன் – வாழ்வு
3. மு.மேத்தா – மரங்கள்
4. சிற்பி – சர்ப்பயாகம்
5. சல்மா – விலகிப்போகும் வாழ்க்கை
6. ஜெயகாந்தன் – இனிப்பும் கரிப்பும்
7. அம்பை – வல்லூறுகள்
8. முனைவர் வ.சுப மாணிக்கம் – சங்க நெறிகள்
9. சோ.நா. கந்தசாமி - தமிழர் பண்பாடு - ஒரு விளக்கம்

அலகு - 2 நீதி இலக்கியம்

- 1.நாலடியார் - அறிவுடைமை (அதிகாரம்-25)
- 2.முதுரை - 5 பாடல்கள் (பா.எண் : 6,16,17,23,26)
- 3.பழமொழி நானூறு - முயற்சி(10 பாடல்கள்)
- 4.நான்மணிக்கடிகை - 5 பாடல்கள் (பா.எண் :1,5,7,8,9)
- 5.திரிகடுகம் - 5 பாடல்கள் (பா.எண் :2,3,5,6,8)

அலகு -3 சிற்றிலக்கியம்

- 1.தமிழ் விடுதாது – தூதுப் பொருள்கள்(101-112)
2. திருக்குற்றாலக் குறவஞ்சி – குறத்தி மலைவளம் கூறுதல்
(6பாடல்கள்)
- 3.முக்கூடற் பள்ளு – பள்ளியர் ஏசல் (161-175)
- 4.கலிங்கத்துப்பரணி – இந்திர சாலம் (154-178)
- 5.அபிராமி அந்தாதி -10 பாடல்கள் பாடல் எண்:
(2,4,6,11,20,26,63,69,71,82)

அலகு -4 இலக்கிய வரலாறு

1. தமிழ்க் கவிதையின் தோற்றமும் வளர்ச்சியும்
2. தமிழ் சிறுகதையின் தோற்றமும் வளர்ச்சியும்
- 3.தமிழ் உரைநடையின் தோற்றமும் வளர்ச்சியும்

அலகு - 5 இலக்கணம்

1. வல்லினம் மிகும் ,மிகா இடங்கள்
- 2.பெயர் ,வினை,இடை , உரிச் சொற்களின் பொது இலக்கணம்
- 3.பிறமொழிச்சொற்களைத் தமிழ்ச் சொற்களாக மாற்றுதல்
(வடமொழி – தமிழ்,
ஆங்கிலம் – தமிழ்)
- 4.பயிற்சிக்குரியன (கவிதை ,சிறுகதை,கட்டுரை படைத்தல்)

பார்வை நூல்கள்

- 1 . தமிழ்த்துறை வெளியீடு
2. இலக்கிய வரலாறு – பேராசிரியர் முனைவர் பாக்யமேரி

15UHL11H	PART-I: HINDI-I	SEMESTER- I
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Total Credits: 4
Hours Per Week: 6

Prose, Non-detailed Text, Grammar & Translation Books Prescribed:

1. PROSE : Nuthan Gadya Sangrah

Editor: Jayaprakash (Prescribed Lessons – only 4)
Lesson 1 - Razia
Lesson 2 - Makreal
Lesson3- Bahtha Pani Nirmala
Lesson 4 – Rashtrapitha Mahathma Gandhi

Publisher: Sumitra Prakashan Sumitravas,
16/4 Hastings Road,
Allahabad – 211 001.

2. NON DETAILED TEXT: Kahani Kunj.

Editor: Dr.V.P.Amithab. (Stories 1 -4 only)
Publisher : Govind Prakashan Sadhar Bagaar,
Mathura,
Uttar Pradesh – 281 001.

3. GRAMMAR : Shabdha Vichar (Sangya, Sarvanam, Karak,
Visheshan) ONLY
(Noun, Pronoun, Adjective, Case Endings) Theoretical &
Applied. Book for
Reference: Vyakaran Pradeep by Ramdev.
Publisher : Hindi Bhavan,
36,Tagore Town
Allahabad – 211 002. 4.

4. TRANSLATION: English- Hindi only. Anuvadh Abhyas – III
(1-10 lessons Only)
Publisher: Dakshin Bharath Hindi Prachar Sabha
Chennai -17.

5. COMPREHENSION : 1 Passage from ANUVADH ABHYAS – III
(16- 30)
Dakshin bharath hindi prachar sabha
Chennai- 17.

15UML11M	PART-I: MALAYALAM-I	SEMESTER-I
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Total Credits: 4
Hours Per Week: 6

Paper I Prose, Composition & Translation

This paper will have the following five units:

- Unit I &II** - Novel
- Unit III & IV** - Short story
- Unit V** - Composition & Translation

TEXT BOOKS:

Unit I &II - Naalukettu – M.T. Vasudevan Nair (D.C. Books, Kottayam, Kerala)

Unit III & IV - Manikkianum Mattu Prathana Kathakalum –
Lalithampika
Antharjanam (D.C.Books, Kottayam, Kerala)

Unit V - Expansion of ideas, General Essay and Translation of a
simple passage from English about **100** words) to
Malayalam

REFERENCE BOOKS:

1. Kavitha Sahithya Charitram –Dr. M.Leelavathi (Kerala Sahithya Academy, Trichur)
2. Malayala Novel sahithya Charitram –K.M.Tharakan(N.B.S. Kottayam)
3. Malayala Nataka Sahithya Charitram-
G.Sankarapillai(D.C.Books, Kottayam)
4. Cherukatha Innale Innu –M.Achuyuthan(D.C. Books, Kottayam)

5. Sahithya Charitram Prasthanangalilude-Dr. K.M. George,(Chief Editor)

(D.C. Books, Kottayam)

15UFL11F	PART-I: FRENCH-I	SEMESTER- I
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Total Credits:4**Hours Per Week:6****French Language for Under-graduate Degree Programmes**

Compétence Culturelle	Compétence De communication	Compétence grammaticale
UNITÉ 1 – Ici, en France		
<ul style="list-style-type: none"> • Moi et les Autres • La France Express 	<ul style="list-style-type: none"> • INTERACTION: s'identifier • RÉCEPTION ECRITE: Comprendre une annonce d'aéroport • RÉCEPTION ORALE: comprendre l'écrit de la rue (Panneaux, plaques, rues...) • PRODUCTION ÉCRITE: écrire un SMS 	<ul style="list-style-type: none"> • Le présent des verbes: Je suis, je reste, J'arrive • Le lieu: (je suis) à... (je suis) ici • L'infinif
UNITÉ 2 – Ici, en classe		
<ul style="list-style-type: none"> • Moi et le français • Le français dans le monde 	<ul style="list-style-type: none"> • INTERACTION: Se présenter • RÉCEPTION ORALE: Comprendre des consignes Orales • RÉCEPTION ÉCRITE: Comprendre une fiche D'inscription • PRODUCTION ÉCRITE: écrire un texte à l'impératif 	<ul style="list-style-type: none"> • Tu/vous • Le présent des Verbes en-er et de être: je, tu, vous • La forme Impérative (tu, vous) Des verbes en-er
UNITÉ 3 – Samedi		
<ul style="list-style-type: none"> • Le fil du temps 	<ul style="list-style-type: none"> • INTERACTION: S'informer • RÉCEPTION ORALE: Comprendre une annonce • RÉCEPTION ÉCRITE: Comprendre un article (titres et illustrations) • PRODUCTION ÉCRITE: écrire des slogans 	<ul style="list-style-type: none"> • Les articles Définies: le, la, les • A, de+le, la, les: Au, aux, du, des, à l', de l' • Être(présent) l'heure • Il faut+nom Il faut+infinitive • Phrases

		verbe+complément, Complément+verbe
UNITÉ 4 - Dimanche		
<ul style="list-style-type: none"> Les activités Culturelles des Français 	<ul style="list-style-type: none"> INTERACTION: Acheter,demander des Informations RECEPTION ORALE: Comprendre les Titres du journal à la radio RÉCEPTION ÉCRITE: Comprendre les Informations PRODUCTION ÉCRITE: Inventer des noms de journaux 	<ul style="list-style-type: none"> Faire, present Avior, present Ll y a Le présent des verbes en-er: Regarder Combien? Quand? Complément de nom: Tremblement de terre, les noms de pays.... Du,des,de la(reprise U2) Les adjectifs possessifs: Mon,ta,son, Ma,ta,sa Mes,tes,ses
UNITÉ 5 - Dommage!		
<ul style="list-style-type: none"> Un baby-boom en 2000 et 2001 L'amour, toujours 	<ul style="list-style-type: none"> INTERACTION: exprimer la tristesse, la peur, conseiller,encourager RÉCEPTION ORALE: Comprendre une émission De radio RÉCEPTION ÉCRITE: Comprendre un sondage PRODUCTION ÉCRITE: écrire des blogs 	<ul style="list-style-type: none"> Est-ce que Le present des verbes pouvoir,Vouloir Le conditionnel des Verbs pouvoir, Vouloir Ne...pas

TEXT BOOK:

1. *Marcella Di Giura Jean-Claude Beacco, Alors I.* Goyal Publishers Pvt Ltd 86, University Block Jawahar Nagar (Kamla Nagar) New Delhi – 110007.

15UEG12E	PART-II: ENGLISH-I	SEMESTER-I
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Total Credits: 4
Hours Per Week: 6

OBJECTIVES:

1. To develop the language competence of the students.
2. To be enriched with functional English.

UNIT-I

PROSE

1. My Financial Career – Stephen Leacock
2. At School – Gandhi
3. Ecology – Barry Commoner

UNIT-II

SHORT STORIES

1. The Gateman's Gift – R.K. Narayan
2. The Open Window – H.H. Munro
3. The Face of Judas Iscariot – Bonnie Chamberlain

UNIT-III

ONE ACT PLAY

1. The Discovery – Herman Ould

UNIT-IV

FUNCTIONAL GRAMMAR

1. Vocabulary Exercises
2. Synonyms, Compound Words, etc
3. Communication Skills – Tasks
4. Different types of sentences
5. The Structure of Sentences
6. Transformation of Sentences

UNIT-V

COMPOSITION TASKS

1. Greeting, Introducing, Requesting, Inviting
2. Congratulating, Thanking, Apologising, Advice
3. Suggestions, Opinions, Permissions.
4. Comprehension

TEXT BOOKS:

1. *Seshasayee. N.* 2001. **Honeycomb.** Anu Chitra Publications, Chennai.
2. *Syamala, V.* 2002. **Effective English Communication for You.** Emerald Publisher, Chennai.

REFERENCE BOOKS:

1. *Rajamanickam. A.* 2001. **Everyman's English Grammar.** Macmillan.
2. *Krishna Mohan and Meera Banerji.* 2005. **Developing Communication Skills.** Macmillan, Chennai.
3. *Wren, P.C. and H. Martin.* 1998. **High School English Grammar and Composition.** Macmillan.

15UMA13A	CORE -I: CLASSICAL ALGEBRA	SEMESTER - I
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Total Credits: 4
Hours Per Week: 5

OBJECTIVES:

The subject aims to build the concepts regarding:

1. On successful completion of this course the students should gain knowledge about the convergence of series.
2. Solving equations by various methods.

CONTENTS

UNIT- I

Binomial, exponential theorems-their statements and proofs – their immediate application to summation and approximation only.

UNIT- II

Logarithmic series theorem-statement and proof-immediate application to summation and approximation only. Convergency and divergency of series -definitions, elementary results-comparison tests- De Alemberts and Cauchy's tests.

UNIT- III

Absolute convergence-series of positive terms-Cauchy's condensation test-Rabee's test.

UNIT- IV

Theory of equations: Roots of an equation- Relations connecting the roots and coefficients- transformations of equations-character and position of roots-Descarte's rule of signs-symmetric function of roots-Reciprocal equations.

UNIT- V

Multiple roots-Rolle's theorem - position of real roots of $f(x)=0$ – Newton's method of approximation to a root – Horner's method.

TEXT BOOK:

1. *Manicavachasam Pillai, T.K. Natarajan, T. and Ganapathy, K.S.* 2006.
Algebra. Viswanathan Printers & Publishers Private Ltd.
2. *Kandasamy, P and Thilagavathy, K.* 2004. **Mathematics Branch I – Vol.I.** S.Chand and Company Ltd. New Delhi.

REFERENCE BOOK:

1. *Michael Artin.* 1991. **Algebra.** PHI Ltd.

15UMA13B	CORE- II: CALCULUS	SEMESTER - I
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Hours Per Week: 5
Total Credits: 4

OBJECTIVES:

The subject aims to build the concepts regarding:

1. On successful completion of this course the students should have gain the knowledge about the evolutes and envelopes
2. To know about the different types of integrations, its geometrical application, proper and improper integration.

CONTENTS

UNIT- I

Curvature-radius of curvature in Cartesian and polar forms-evolutes and envelopes pedal equations-total differentiation-Euler's theorem of homogeneous functions.

UNIT- II

Integration of $f'(x)/f(x)$, $f'(x)\sqrt{f(x)}$, $(px+q)/\sqrt{ax^2+bx+c}$, $[\sqrt{x-a}/(b-x)]$, $[\sqrt{(x-a)(b-x)}]$, $1/[\sqrt{(x-a)(b-x)}]$, $1/(\cos x + b \sin x + c)$, $1/(\cos^2 x + b \sin^2 x + c)$, Integration by parts.

UNIT- III

Reduction formulae-problems-evaluation of double and triple integrals-applications to calculations of areas and volumes-areas in polar coordinates.

UNIT- IV

Change of order of integration in double integral-Jacobions- change of variables in double and triple integrals.

UNIT- V

Beta and Gamma Integrals-their properties, relation between them-evaluation of multiple integrals using Beta and Gamma functions.

TEXT BOOKS:

1. *Narayanan,S and Pillai, T.K.M.* 2009. **Calculus vol 1and 2 -** Viswanathan Publishers.
2. *Kandasamy,P and Thilagavathy,K.* 2004. **Mathematics for BSc – Vol I and II.** S.Chand and Company.

REFERENCE BOOKS:

1. *Shanthi Narayanan and Kapoor,J.N.* 2003. **A Text book of Calculus.** S.Chand & Co.

15UMA1AA	ALLIED- I: STATISTICS- I	SEMESTER – I
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Total Credits: 4
Hours Per Week: 6

OBJECTIVES:

1. On successful completion of the paper the students should have understood the concepts of probability and random variable.
2. To gain the knowledge about various discrete and continuous probability distributions.
3. To know about the concepts of correlation and regression.

CONTENTS

UNIT - I

Random variables- Discrete and continuous random variables – Distribution function-properties- Probability mass function, Probability density function-Mathematical expectation – Addition and multiplication theorems on expectations

UNIT - II

Moment generating and cumulative generating - Characteristic functions and their properties. Joint probability distributions-marginal and conditional probability distributions-Independence of random variables-transformation of variables (One & Two dimensional only) Chebychev's inequality, weak law of large numbers and central limit theorem.

UNIT- III

Discrete probability distributions: Binomial, Poisson and Normal distributions and their properties (MGF, Characteristic function, Additive properties, Mean & Variance and simple problems).

UNIT - IV

Exact probability distributions: Chi-square distribution- Student t distribution and f distribution their probability density functions and their properties. (MGF, Characteristic function, Additive properties).

UNIT - V

Curve fitting and principle of least squares: fitting of curves of straight line, second degree parabola, power curve and exponential curves- correlation and regression analysis.

TEXT BOOKS:

1. *Guptha, S.C and Kapoor, V.K.* 2007. **Fundamentals of Mathematical statistics.** S.Chand & co. New Delhi.
2. *Guptha, C.B and Vijay Guptha* .2007. **Introduction to Statistical methods.** S.Chand & Co.New Delhi.

15UTL21T	பகுதி – I: தமிழ் தாள் -II	இரண்டாம் பருவம்
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Total Credits: 4
Hours Per Week: 6

(ஓர் ஆண்டு தமிழ் பயிலும் மாணவர்களுக்கு உரியது)
முதல் ஆண்டு
சங்க இலக்கியம்- பக்தி இலக்கியம் – காப்பியம்

அலகு 1 சங்க இலக்கியம்

1. நற்றிணை – பாடல் எண் : 210 (நெய்தல்) ‘நெடியமொழிதலும் கடிய ஊர்தலும்’
2. குறுந்தொகை –பாடல் 2 , 3 (குறிஞ்சி) ‘கொங்குதேர் வாழ்க்கை’, ‘நிலத்தினும் பெரிதே’
3. கலித்தொகை – பாடல் 16 நெய்தல்கலி - ‘ஆற்றுதல் என்பது’
4. புற நானூறு – பாடல் 184, 312 ‘உற்றுழி உதவியும்’, ‘ஈன்று புறந்தருதல்’
5. ஐங்குறுநூறு – மருதம் முதல் 5 பாடல்கள் (வேட்கைப் பத்து)

அலகு -2 காப்பியங்கள்

- 1.சிலப்பதிகாரம் – வழக்குரை காதை
- 2.மணிமேகலை – ஆதிரை பிச்சையிட்ட காதை
- 3.சீவக சிந்தாமணி- நாமகள் இலம்பகம்(நாட்டு வளம் முதல் 20 பாடல்கள்)
- 4.கம்பராமாயணம் – வாலிவதைப் படலம் (வாலி இராமனை வினவுதல்.பாடல் எண்கள் (4121 முதல் 4136 வரை)

அலகு 3 பக்தி இலக்கியம்

1. தேவாரம் – திருஞானசம்பந்தர் (கோளறுபதிகம்)
2. திருப்பாவை –ஆண்டாள் (முதல் 15 பாடல்கள்)
3. தேம்பாவணி- காட்சிப்படலம் (முதல் 15 பாடல்கள்)
- 4.சீறாப்புராணம் –மானுக்குப் பிணை நின்ற படலம்

அலகு-4 இலக்கிய வரலாறு

- 1.முச்சங்க வரலாறு
- 2.சங்க இலக்கிய வரலாறு
- 3.பக்தி இலக்கியத்தின் தோற்றமும் வளர்ச்சியும்
- 4.காப்பியத்தின் தோற்றமும் வளர்ச்சியும்

அலகு -5 இலக்கணம்

- 1.எழுத்து, அசை, சீர், தளை, அடி, தொடை பொது இலக்கணம்
- 2.தொகை நிலைத் தொடர்கள்

பார்வை நூல்கள்

1. தமிழ்த்துறை வெளியீடு
2. இலக்கிய வரலாறு – பேராசிரியர் முனைவர் பாக்யமேரி

15UHL21H	PART-I: HINDI-II	SEMESTER- II
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Total Credits: 4
Hours Per Week: 6

(Modern Poetry, Novel, Translation & Letter Writing)

1. Modern Poetry: Shabari – By Naresh Mehtha

Publishers: Lokbharathi Prakashan I Floor, Duebari Building
Mahathma Gandhi Marg,
Allahabad -1.

2. Novel: Seva Sadhan – By Prem Chand

Publisher:

3. Translation: Hindi – English Only,
(anuvadh abyas – iii) lessons.1 – 10 only

Publisher: dakshin bharath hindi prachar sabha chennai –
600 017.

4. Letter Writing: (Leave letter, Job Application, Ordering
books, Letter to Publisher, Personal letter)

15UML21M	PART-I: MALAYALAM-II	SEMESTER- II
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Total Credits: 4
Hours Per Week: 6

PAPER II PROSE: NON-FICTION

This Paper will have the following five units:

UNIT I & II

Biography

UNIT III, IV & V

Travelogue

TEXT BOOKS PRESCRIBED:

Unit I & II *Changampuzha Krishna Pillai: Nakshatrangalude Snehabhajanam*
–M.K. Sanu (D.C. Books, Kottayam)

Unit III, IV & V *Kappirikalude Nattil – S.K. Pottakkadu* (D.C. Books,
Kottayam)

REFERENCE BOOKS:

1. Jeevacharitrashathyam –Dr. K.M. George(N.B.S. Kottayam)
2. Jeevacharitrashathyam malayalathil- Dr. Naduvattom
Gopalakrishnan(Kerala Bhasha Institute, Trivandrum)
3. Athmakathashathyam malayalathil –Dr. Vijayalam
Jayakumar(N.B.S. Kottayam)
4. Sancharashathyam Malayalathil-Prof.Ramesh Chandran. V,(Kerala
Bhasha Institute, Trivandrum)

15UFL21F	PART-I: FRENCH-II	SEMESTER- II
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Total Credits: 4
Hours Per Week: 6

French Language for Under-graduate Degree Programmes

Compétence Culturelle	Compétence De communication	Compétence grammaticale
UNITÉ 6 – Super!		
<ul style="list-style-type: none"> • L'égalité homme/femme 	<ul style="list-style-type: none"> • INTERACTION: Exprimer des sentiments, exprimer la joie, le plaisir, le bonheur • RÉCEPTION ORALE: Comprendre un jeu radiophonique • RÉCEPTION ÉCRITE: Comprendre des annonces • PRODUCTION ÉCRITE: Écrire des cartes postales 	<ul style="list-style-type: none"> • Les noms de professions masculine/feminine • Le verbe finir et les Verbes du groupe en-ir • Le present de l'impératif • Savoir(present) • Le participe passé: Fini, aimé, arrive, dit,écrit • Quel(s), quelle(s)..: Interrogatif et Exclamatif • À + infinitive • Les articles: n,une,des
UNITÉ 7 – Quoi?		
<ul style="list-style-type: none"> • Le 20 siècle: Petits progrès Grand progrès 	<ul style="list-style-type: none"> • INTERACTION: Decrire quelque chose, une personne • RECEPTION ORALE: Comprendre un message publicitaire • RÉCEPTION ÉCRITE: Comprendre un dépliant touristique • PRODUCTION ÉCRITE: Écrire des petites annonces 	<ul style="list-style-type: none"> • On • Plus, moins • Le verbe aller: • Present, impératif • Aller + infinitive • Le pluriel en -x
UNITÉ 8 – Et après		
<ul style="list-style-type: none"> • Nouvelles du jour 	<ul style="list-style-type: none"> • INTERACTION: Raconteur,situer un récit 	<ul style="list-style-type: none"> • L'imparfait:: quel-Ques forms pour

	<p>dans le temps</p> <ul style="list-style-type: none"> • RÉCEPTION ORALE: Comprendre une description • RÉCEPTION ÉCRITE: Comprendre un test • PRODUCTION ÉCRITE: écrire des cartes postales 	<p>introduire le récit:Il faisait, il y avait, il Était</p> <ul style="list-style-type: none"> • Un peu, beaucoup, trop,Assez • Très • Le verbe venir: Présent, impératif • En Suisse, au Maroc, aux Etats-Unis
UNITÉ 9 – Mais oui!		
<ul style="list-style-type: none"> • La génération des 20-30 ans 	<ul style="list-style-type: none"> • INTERACTION: Donner son opinion, Expliquer pourquoi • RÉCEPTION ORALE: Comprendre des informations à la radio • RÉCEPTION ÉCRITE: Comprendre un texte informatif • PRODUCTION ÉCRITE: écrire un mél de protestation 	<ul style="list-style-type: none"> • Répondre, prendre: Présent, impératif, part Passé • Parce que pourquoi • Tout/tous, toute/s Tous/toutes les... (répétition action)
UNITÉ 10 – Mais non!		
<ul style="list-style-type: none"> • De la ville à la campagne 	<ul style="list-style-type: none"> • INTERACTION: Débat:: exprimer l'accord, exprimer le Désaccord • RECEPTION ORALE: Comprendre un message sur un répondeur téléphonique • RÉCEPTION ÉCRITE: Comprendre un témoignage • PRODUCTION ECRITE: Rediger des petites Announces immobilières 	<ul style="list-style-type: none"> • Le verbe devoir: Present et participe passé • Le verbe vivre, present • Aller + infinitive • Venir+ infinitive • Etre pour/contre

TEXT BOOK:

1. *Marcella Di Giura Jean-Claude Beacco, Alors I.* Goyal Publishers Pvt Ltd 86, University Block Jawahar Nagar (Kamla Nagar) New Delhi – 110007.

15UEG22E	PART- II: ENGLISH-II	SEMESTER II
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Total Credits: 4
Hours Per Week: 6

OBJECTIVES:

1. To develop the language competence of the students.
2. To be enriched with functional English.

UNIT-I

PROSE

1. Words of Wisdom – Chetan Bhagat
2. Forgetting – Robert Lynd
3. My Early Days – Dr. Abdul Kalam

UNIT-II

SHORT STORIES

1. Am I Blue? – Alice Walker
2. Last Leaf – O Henry
3. Selfish Giant – Oscar Wilde

UNIT-III

ONE ACT PLAY

1. Soul Gone Home - Langston Hughes

UNIT-IV

FUNCTIONAL GRAMMAR

1. Lexical Skills and Question Forms
2. Idioms and Phrases – Subject-Verb Agreement
3. Spelling, Antonyms and Synonyms, Infinitives
4. Vocabulary, Report Writing
5. Plurals, Particles in Adjectives
6. Apostrophe, Archaic Words, Art of Persuasion
7. Syllables, Changing Adjectives to Nouns
8. Homonyms, Prepositions
9. Compound Words, Acronyms, Collective Nouns, Degrees of Comparison

UNIT-V

COMPOSITION TASKS

1. Letter Writing - Structure
2. Business Correspondence – Memos, reports, proposals
3. Resume & C.V.
4. Advertisements
5. Notices, Agenda, Minutes
6. Circulars
7. Essay Writing
8. Précis Writing
9. Dialogue Writing
10. Soft Skills, Business English

TEXT BOOKS:

1. *Board of Editors.* 2012. **Radiance – English for Communication.**
Emerald Publishers.
2. *Syamala, V.* 2002. **Effective English Communication for You.**
Emerald Publisher. Chennai.

REFERENCE BOOKS:

1. *Rajamanickam. A.* 2001. **Everyman's English Grammar.**
Macmillan.
2. *Krishna Mohan and Meera Banerji.* 2005. **Developing
Communication Skills.** Macmillan. New Delhi.
3. *Wren, P.C. and H. Martin.* 1998. **High School English Grammar
and Composition.** Macmillan.

15UMA23A	CORE- III: ANALYTICAL GEOMETRY	SEMESTER - II
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Total Credits: 4
Hours Per Week: 5

OBJECTIVES:

The subject aims to build the concepts regarding:

1. This course gives emphasis to enhance students' knowledge in two dimensional and three dimensional analytical geometry.
2. Conic sections in polar coordinates and the geometrical aspects of three dimensional figs sphere, cone and cylinder.

CONTENTS

UNIT- I

Analytical geometry of two dimensions: - Polar coordinates Equation of a conic- directrix chord- tangent-normal-simple problems - only in deriving equation of a conic.

UNIT -II

Analytical geometry of three dimensions:-Straight lines-Coplanarity of straight lines- Shortest distance (S.D) and Equation of S.D between two lines-simple problems.

UNIT -III

SPHERE: Standard equation of sphere -results based on the properties of a sphere- Tangent plane to a sphere - Equations of a circle.

UNIT -IV

CONE AND CYLINDER:- cone whose vertex is at the origin-enveloping cone of a sphere right circular cone-equation of a cylinder-right circular cylinder.

UNIT -V

CONICOID:-Nature of a conicoid-Standard equation of a central conicoid- Enveloping cone-Tangent plane - conditions for tangency - directrix sphere and directrix plane.

TEXT BOOKS:

1. *Durai Pandian, P. Laxmi duraipandian and Mukilan,D.*2003.
Analytical Geometry. S.Chand and Company.
2. *Bali, N.P.* 2005. **Solid Geometry.** Laxmi Publications (P) Ltd.

REFERENCE BOOKS:

1. *Manicavachasam Pillai, T.K. Natarajan,T. and Ganapathy,K.S.* 2006.
Analytical Geometry of 2D.Viswanathan publications.
2. *Khanna, M.L.* 2005. **Solid Geometry.** Jainath & Co Publishers.
Meerut.

15UMA23B	CORE -IV: MS OFFICE	SEMESTER - II
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Total Credits: 4
Hours Per Week: 3

OBJECTIVES:

1. To enable students gain fundamental knowledge about the concepts of Operating systems and their applications.
2. To know about the Excel, Power point and Access tools.

CONTENTS

UNIT - I

Windows 2000-working with windows-moving formation within windows arranging Icons-Saving Window settings.MS Office Basics-Creating document entering text- giving instructions-Using tool bars-Menu commands-Keyboards shortcuts-Saving files-Opening documents-Manipulating Windows-Simple Editing-Printing Files.

UNIT-II

Word Basics – Using Auto text – Using Auto Correct Word editing technique – finding and replacing text – Checking spelling – using templates – formulating Formatting with styles creating tables.

UNIT-III

Excel Basics – entering data – selecting Range – Editing entries – formatting entries – Simple Calculation – naming cells and Ranges – Data display – Printing worksheets – Copying entries between workbooks – Moving sheets between workbook – deleting sheets – Creating graphs.

UNIT-IV

Power Point Basics – Working in outline view – using design templates – Merging presentations in Slider order view applying templates – adding graphs – adding organization charts.

UNIT-V

Access Basics – Creating a table – entering and adding records – Changing a structure – working with records – Creating forms – establish able relationship using queries to extract information.

TEXT BOOKS:

1. *Stephen L. Nelson.* 2000. **The complete reference office 2000.** Tata McGraw Hill Publishers Private Ltd.
2. *Sanjay Saxena.* 2007. **MS Office 2000 for everyone.**

REFERENCE BOOK:

1. *Bible.* 2007. **Microsoft Office 2007.** Wiley India.

15UMA23P	CORE LAB - I: MS OFFICE	SEMESTER - II
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Total Credits: 2
Hours Per Week: 2

MS - WORD

1. Typing the text, check spelling and grammar bullets and numbering list items, align the text to left, right justify and centre.
2. Preparing a job application letter enclosing your Bio-Data.
3. Creating Lables and Performing Mail Merge Operation.
4. Preparing the document in newspaper column layout.

MS - EXCEL

5. Preparing Worksheet Using Formulae.
6. Creating electricity bill in a Worksheet.
7. Illustrating class performance by drawing graphs.
8. Preparing sales invoice for five companies using worksheet.

MS - ACCESS

9. Sorting techniques on students' database and printing the address using label format.
10. Preparing a Payroll report .
1. 11. Creating a Inventory control system.
11. Screen designing for data entry.

MS - POWERPOINT

12. Preparing a PowerPoint presentation with at least three slides for department Inaugural function.
 13. Drawing an organization chart with minimum three hierarchical levels.
 14. Designing an advertisement campaign with minimum three slides.
- Inserting an excel chart into a Power Point slide.

15UMA2AA	ALLIED -II: STATISTICS- II	SEMESTER - II
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Total Credits: 4**Hours Per Week: 6****OBJECTIVES:**

The subject aims to build the concepts regarding:

1. On successful completion of the paper the students should have understood the concepts of estimation.
2. To know about testing, sampling and design of experiments.

CONTENTS**UNIT - I**

Concept of population, sample, statistics, parameter-point estimation-concept of point estimation – Characteristics of Estimator: consistency, unbiasedness, efficiency- sufficiency-Neyman factorization theorem-Cramer Rao inequality -Rao-Blackwell theorem.

UNIT - II

Methods of estimation-maximum likelihood, moments, and minimum chi-square –properties-Interval estimation –confidence interval-derivation of confidence intervals based normal, t, and chi-square and F.

UNIT - III

Test of hypothesis: Type-I and II errors-power test –Neyman-Pearson Lemma-likelihood ratio tests-concept of most powerful test (statements and results only). Test of significance-standard error-large sample tests with respect to mean, standard deviation, proportion, difference between means, standard deviations and proportions-Small sample test with respect to student t, chi-square and F distributions-simple problems.

UNIT - IV

Sampling- Types of sampling: Purposive sampling, Random sampling, simple sampling, Stratified random sampling and systematic sampling-parametric and statistics- sampling distribution of a statistics- standard error- Sampling and non sampling errors.

UNIT - V

Analysis of variance: one way & two way classifications and their properties-Experimental designs – simple problems.

TEXT BOOKS:

1. *Guptha, S.C and Kapoor, V.K.* 2007. **Fundamentals of Mathematical statistics.** S.Chand & Co. New Delhi.
2. *Guptha, S.C and Kapoor, V.K.* 2007. **Fundamentals of Applied statistics.** S.Chand & Co.New Delhi.
3. *Gupta, S.P.***Statistical Methods.** 2007. S.Chand & co, New Delhi.

15UMA33A	CORE- V: TRIGONOMETRY, VECTOR CALCULUS AND FOURIER SERIES	SEMESTER - III
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Total Credits: 4

Hours Per Week: 5

OBJECTIVES:

1. Students should realize the concept about the trigonometry functions.
2. Students should know about the concept of Fourier series.

CONTENTS

UNIT -I

Expansion of $\cos n\phi$, $\sin n\phi$, $\cosh n\phi$, $\sinh n\phi$ - Hyperbolic functions - Separations of real and imaginary parts of $\sin(\alpha + i\beta)$, $\cos(\alpha + i\beta)$, $\tan(\alpha + i\beta)$, $\sinh(\alpha + i\beta)$, $\cosh(\alpha + i\beta)$, $\tanh(\alpha + i\beta)$, $\tan^{-1}(\alpha + i\beta)$

UNIT-II

Logarithm of a complex number-Summation of trigonometric Series.

UNIT-III

Scalar and vector point functions-Differentiation of vectors-Differential operators -Directional derivative, gradient, Divergence, Curl.

UNIT-IV

Integration for vectors: Line, Surface and Volume integrals, Theorems of Gauss, Green, Stokes (Statements only) - Verifications.

UNIT-V

Fourier Series: Definition - Finding Fourier coefficients for a given periodic function with period 2π -Odd and even functions - Half range series - change of interval.

TEXT BOOKS:

1. *Narayanan,S and Pillai, T.K.M.* 2009. **Trigonometry**.Viswanathan Publishers.
2. *Narayanan,S and Pillai, T.K.M.* 2009. **Fourier Series**.Viswanathan Publishers.
3. *Durai Pandian, P. Laxmi duraipandian and Mukilan,D.* 2003. **Vector Calculus**. S.Chand and Company.

REFERENCE BOOKS:

1. *Kandasamy.P. Thilagavathi ,K.* 2003. **Mathematics Volume IV** (Vector Calculus, Fourier Series). S.Chand & Company Ltd., Ramnagar, New Delhi.

15UMA33B	CORE- VI: STATICS	SEMESTER - III
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Total Credits: 4
Hours Per Week: 5

OBJECTIVE:

1. Students should realize the concept about the forces, resultant force of more than one force acting on a surface, friction and center of gravity.
2. Students can differentiate static and dynamic forces.

CONTENTS

UNIT - I

Forces acting at a point – Parallelogram law-triangle law

UNIT - II

(λ, μ) theorem - Polygon of forces-conditions of equilibrium.

UNIT - III

Parallel Forces-Moments and couples composition of parallel forces (like and unlike)

UNIT - IV

Moment of a force about a point-Varignons theorem - Co-planar forces acting on a rigid body – Theorem on three co-planar forces in equilibrium

UNIT - V

Reduction of a system of co-planar forces to a single force and a couple - necessary & sufficient conditions of equilibrium only – Equation to the line of action of the resultant.

TEXT BOOKS:

1. Venkataraman, M.K. 1999. **Statics**. Agasthiar Publications, Trichy.
2. Viswanatha Naik, K. and Kasi, M. S. 2001. **Statics**. Emerald Publishers.

REFERENCE BOOK:

1. *Duraipandian, P. Laxmi Duraipandian.* 1985. **Mechanics.** S.Chand and Company Ltd, Ram Nagar, New Delhi -55

15UMA33C	CORE - VII: PROGRAMMING IN C	SEMESTER - III
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Hours Per Week: 4

Total Credits: 3

OBJECTIVE:

1. The students should have: Learnt the basic structure, operators and statements of c language.
2. They learnt the decision making statements and to solve the problems based on it.

CONTENTS

UNIT - I

Introduction – Importance of C - Basic structure of C program - Character set Constants – Keywords and identifiers – Variables Data types – Declaration of variables – Assigning values to variables –Defining symbolic constants.

UNIT - II

Arithmetic operators - Relational operators - logical operators - assignment operators -increment and decrement operates -Conditional operators – Special operators – Arithmetic expressions –Evaluation of expressions –Precedence of arithmetic operators – Some computational problems –Type conversion in expressions – operator precedence and associating mathematical functions.

UNIT - III

Reading and Writing character – formatted input and output. Decision making with IF statement – Simple IF statement – The if ELSE statement – Nesting of IF.....ELSE statement – The ELSE IF ladder. The Switch statement –The ?: Operator –The GOTO statement.

UNIT - IV

The WHILE statement - the DO statement the FOR statement –Jumps in loops.

UNIT - V

One, Two dimensional arrays – Initiating two dimensional arrays – Multidimensional arrays –Declaring and initializing string variables – reading strings from terminal – Writing strings on the screen – Arithmetic operations on characters.

TEXT BOOK:

1. *Balagurusamy, E. 2007. **Programming in ANSI C.** Second Edition. Tata McGraw – Hill Publishing company limited, New Delhi.*

REFERENCE BOOK:

1. *Byron Gottfried. 1998. **Programming with C.** Tata McGrawHill publishing company.*

15UMA33P	CORE LAB - II: PROGRAMMING IN C	SEMESTER - III
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Hours Per Week: 2

Total Credit :2

1. Generating of n Fibonacci number.
2. Solving the Quadratic equations.
3. Calculating Measures of central tendency, Variance and Standard Deviation.
4. Sorting a set of numbers.
5. Sorting a set of names.
6. Finding a factorial value using recursive function call.
7. Finding the product of two matrices.
8. Programming to prepare a pay list.

15UPA3AA	ALLIED- III: BUSINESS ACCOUNTING – I	SEMESTER – III
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Total Credits: 4
Hours Per Week: 7

OBJECTIVES:

To give a clear about the basic accounting vocabulary;

1. To analyze business transactions from an accounting viewpoint;
2. To recognize, record, and classify new accounting data.

CONTENTS

Unit – I

Fundamentals of Book Keeping: Definition, objectives, methods of accounting, Branches of accounting, Types of Accounts and Accounting rules – Accounting Concepts and Conventions – Journal – Ledger – Subsidiary books: Purchases Book, Sales Book, Purchases Returns, Sales Return book, Cash Book (Single Column, Double Column and Triple Column) - Trial balance.

Unit – II

Final accounts of a sole trader with adjustments: Trading Account, Profit and loss account, Balance Sheet, Adjustments

Unit – III

Bill of exchange: Definition of bill of exchange, essentials of Bill of exchange, classification of bill of exchange, Accounting Treatment Of Bill Of Exchange (bill retained, bill discounted with bank, bill endorsed, bill sent for collection, renewal of bill, Accommodation bills) – Average Due Date: Meaning, determination of due date, types of problems (where amount is lent in different installments and where amount lent in single installment) – Account current: Meaning, Methods of Calculation of Interest : Interest table method, Product Method, Red Ink Interest Method, Epoque Method and varying interest rate method.

Unit – IV

Accounting for consignments and Joint ventures: Consignment Meaning, definition, features, account sales, valuation of unsold stock, goods sent on consignment at cost price and invoice price, various commission to

consignee (only Problem). Joint venture: Meaning, features, distinction between joint venture and partnership, joint venture and consignment, accounting treatment for joint venture: when keeping separate sets of books is kept and without keeping separate set of books(Only Theory).

Unit – V

Cost accounting – Meaning – definition – Difference between cost accounting and financial accounting- Advantages and disadvantages- Element of cost – preparation cost sheet – stock levels-EOQ-Methods of pricing of stock issue-FIFO-LIFO Simple average method – weighted average method.

TEXT BOOKS:

1. *Vinayakam N., Mani P.L., and Nagarajan K.L., 2003, **Principles of Accountancy***, S.Chand & Company Ltd., New Delhi
2. *Jain S P and Narang K L, 2000, **Cost accounting***, Kalyani publishers, New Delhi

REFERENCE BOOKS:

1. *Gupta R.L., Gupta V.K. and Shukla M.C., 2006, **Financial Accounting***, Sultan chand & sons, New Delhi.
2. *Maheswari S.K., and Reddy T.S., 2005, **Advanced Accountancy***, Vikas publishers, New Delhi.

15UMA3SA	SKILL BASED SUBJECT- I: OPERATIONS RESEARCH - I	SEMESTER - III
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Credit Points: 3

Hours Per Week: 3

OBJECTIVES:

1. Students should have gained knowledge about optimal use of resources.
2. To know about the concept of simplex and duality.

CONTENTS

UNIT - I

Basics of O.R – Definition of O.R – Characteristics of O.R - Scientific methods in O.R – Necessary of O.R in Industry – O.R and Decision Making – Scope of O.R in Modern Management – Uses and limitations of O.R. Linear Programming Problem – Formulation of L.P.P – Graphical solutions of L.P.P – Problems.

UNIT - II

Simplex Method – Charnes Penalty Method (or) Big – M Method - Two Phase Simplex method – Problems.

UNIT - III

Duality in L.P.P – Concept of duality – Duality and Simplex Method – Problems

UNIT - IV

The transportation Problems – Basic feasible solution by L.C.M – NWC-VAM optimum solutions – unbalanced Transportation problems

UNIT - V

The Assignment Problems – Assignment algorithm – optimum solutions – Unbalanced Assignment Problems.

TEXT BOOKS:

1. *Prem Kumar Gupta ,D. S. and Hira.*1998. **Operations Research**.S. Chand & Company Ltd. Ram Nagar, New Delhi.
2. *Kandiswarup, P. K. Gupta. Man Mohan.*1998.**Operations Research** . S. Chand & Sons Education Publications, New Delhi.

REFERENCE BOOKS:

1. *Taha, H.A.* 2006. **Operations Research: An Introduction**. Eighth Edition. Prentice Hall of India Private Limited, New Delhi.

15UMA43A	CORE - VIII: DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS	SEMESTER - IV
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Total Credits: 4
Hours Per Week: 5

OBJECTIVES:

1. The students should gain the knowledge about the method of solving Differential Equations.
2. It also exposes Differential Equation as a powerful tool in solving problems in Physical and Social sciences.

CONTENTS

UNIT - I

Ordinary Differential Equations: Equations of First Order and of Degree Higher than one - Solvable for p , x , y - Clairaut's Equation - Simultaneous Differential Equations with constant coefficients of the form (i) $f_1(D)x + g_1(D)y = \varphi_1(t)$ (ii) $f_2(D)x + g_2(D)y = \varphi_2(t)$ where f_1, g_1, f_2 and g_2 are rational functions $D = d/dt$ with constant coefficients $\varphi_1(t)$ and $\varphi_2(t)$ explicit functions of t .

UNIT - II

Finding the solution of Second and Higher Order with constant coefficients with Right Hand Side is of the form Ve^{ax} where V is a function of x - Euler's Homogeneous Linear Differential Equations - Method of variation of parameters.

UNIT - III

Partial Differential Equations: Formation of equations by eliminating arbitrary constants and arbitrary functions - Solutions of Partial Differential Equations - Solutions of Partial Differential Equations by direct integration - Methods to solve the first order P.D. Equations in the standard forms - Lagrange's Linear Equations.

UNIT - IV

Laplace Transforms: Definition – Laplace Transforms of standard functions – Linearity property – First Shifting Theorem – Transform of $t f(t)$, $f(t)/t$, $f^{-1}(t)$, $f^{(n)}(t)$.

UNIT - V

Inverse Laplace Transforms – Applications to solutions of First Order and Second Order Differential Equations with constant coefficients.

TEXT BOOKS:

1. Kandasamy, P and Thilagavathi, K. 2004. **Mathematics for B.Sc – Branch – I Volume III**. S. Chand and Company Ltd, New Delhi.
2. Narayanan, S and Manickavasagam Pillai, T.K. 1991. **Calculus**. S. Viswanathan (Printers and Publishers) Pvt. Ltd, Chennai .

REFERENCE BOOKS:

1. Vittal, P.R. and Malini.V. 2012. **Calculus**. Margham Publications.

15UMA43B	CORE- IX: DYNAMICS	SEMESTER- IV
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Total Credits: 4
Hours Per Week: 5

OBJECTIVES:

1. The students understand the reason for dynamic changes in the body.
2. To know about the concept of orbit and pedal equations.

CONTENTS

UNIT - I

Projectiles: Path of a projectile-Greatest height-time of flight-range on an inclined plane through the point of projection-Maximum range.

UNIT - II

Central Orbits: Radial and transverse components of velocity and acceleration – area velocity - Differential equation of central orbit – Pedal equations.

UNIT -III

Simple Harmonic Motion: Amplitude, periodic time, phase-composition of two simple harmonic motions of the same period in a straight line and in two perpendicular lines.

UNIT- IV

Impact on a fixed surface: Impulsive force-Impact on a smooth fixed plane -Direct and oblique impact of two smooth spheres

UNIT -V

Loss of Kinetic energy during direct and oblique impacts.

TEXT BOOKS:

1. *Venkataraman, M.K.*1994. **Dynamics**. 11th Edition. Agasthiar Publications. Trichy.
2. *Dharamapadam, A.V.* 1998. **Dynamics**. S.Viswanathan Printers and Publishers Pvt., Ltd,Chennai.

REFERENCE BOOKS:

1. *Viswanatha Naik and K. Kasi, M.S.*1992 **.Dynamics**. Emerald Publishers.
2. *Naryanamurthi.* 1991. **Dynamics**. National Publishers. New Delhi.

15UMA43C	CORE -X: PROGRAMMING IN C++	SEMESTER - IV
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Total Credits: 3
Hours Per Week: 4

OBJECTIVE:

1. The students should have learnt class structure, member functions & data members. Learnt the concept of inheritance, types and example problems.
2. They learnt the concepts of polymorphism, types and problems.

CONTENTS

UNIT - I

Evolution of C++ - applications of C++ - structure of C++ program. Tokens - keywords - identifiers and constants - basic data types - user-defined data types - constant pointers and pointers to constants - symbolic constants -type compatibility - declaration of variables - dynamic initialization of variables - reference variables - operators in C++ - scope resolution operator - memory management operators - manipulators - type cast operator - expressions and their types - special assignment expressions - implicit conversions - operator precedence.

UNIT - II

Functions in C++ : The main function - function prototyping - call by reference - return by reference - inline functions - default arguments - const arguments - function overloading. Managing Console I/O Operations: C++ streams - C++ stream classes - unformatted console I/O operations - formatted console I/O operations -managing output with manipulators.

UNIT - III

Classes and Objects: Specifying a class - defining member functions - making an outside function inline - nesting of member functions - private member functions - arrays within a class - memory allocation for objects -arrays of objects - objects as function arguments - friend functions - returning objects - const member functions. Constructors and Destructors: Introduction - constructors - parameterized constructors -

multiple constructors in a class – constructors with default arguments – copy constructor.

UNIT - IV

Operator Overloading: Introduction – defining operator overloading – overloading unary operators – overloading binary operators – overloading binary operators using friends – rules for overloading operators. Inheritance: Introduction – defining derived classes – single inheritance – making a private member inheritable – multilevel inheritance – multiple inheritance – hierarchical inheritance – hybrid inheritance.

UNIT - V

Working with Files: Introduction – Classes for File Stream Operations – Opening and Closing a File – Detecting End-of-file – More about open(): File Modes – File Pointers and their Manipulations – Sequential Input and Output Operations – Updating a File: Random Access.

TEXT BOOKS:

1. *Balagurusamy, E.* **Object Oriented Programming with C++**. McGraw Hill.
2. *Robert Lafore .* 1994. **Object Oriented Programming in Turbo C++**. Galgotia publications Pvt.Ltd, New Delhi- 110002 .
3. *Bjarne Stroutstrup.* 1991. **The C++ programming language**. II Edition. Addison Wesley.

REFERENCE BOOKS:

1. *Ravi Chandran,D.* 1996. **Programming with C++**. Tata McGraw-Hill publishing company limited , New Delhi.
2. *Ashok N.Kamthane.***Object Oriented Programming with ANSI and Turbo C++**. Pearson Education publishers.
3. *John R.Hubbard.* 2002. **Programming with C++**. 2nd Edition. TMH publishers.

15UMA43P	CORE LAB-III: PROGRAMMING IN C++	SEMESTER - IV
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Total Credits: 2
Hours Per Week: 2

1. Writing a function 'power()' to raise a number 'm' to a power 'n'.
2. Writing a program to compute compound interest using function overloading .
3. Creating a class which consists of employee details, Deriving a class PAY from the above class and calculating DA, HRA and PF depending on the grade and display the pay slip in a neat format using console I/O.
4. Defining two classes POLAR and RECTANGLE to represent points in the polar and rectangle system. Writing a program to convert from one system to another.
5. Creating a class FLOAT that contains one float data member. Overload all the four arithmetic operators so that they operate on the objects of FLOAT.

15UPA4AA	ALLIED -IV: BUSINESS ACCOUNTING - II	SEMESTER - IV
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Total Credits: 4
Hours Per Week: 7

Note: The question paper shall cover 20% theory and 80% problem

OBJECTIVES:

1. To know the various methods of depreciations and preparation of single entry accounts;
2. To introduce accounting methods for hire purchase system and branch accounts ;
3. To learn the preparation of various budgets and budgetary control;

CONTENTS

Unit - I

Depreciation - Meaning- Features- Methods- Straight Line Method- Written Down Value Method - Annuity Method.

Unit - II

Single Entry System - Meaning and Features -Limitations- Advantages- Statement of Affairs Method and Conversion Method.

Unit - III

Branch Accounts - Introduction - Meaning - Objectives - Types of Branches - Dependent Branches - Features - Supply of Goods at Cost Price - Invoice Price - Branch Account in the books of Head Office - Debtors System Only (Excluding foreign branches).

Unit - IV

Hire Purchase and Installment Systems- Accounting treatment- Calculation of interest -Default and repossession (Excluding Hire Purchase Trading Account)

Unit – V

Budgeting- meaning and definition- advantages and disadvantages – production budget, sales budget, Cash budget, flexible budget.

TEXT BOOKS:

1. *Dr. Maheswari S.N., 2004 , “Management Accounting”,* Sultan Chand & Sons, New Delhi.
2. *Gupta R.L., Gupta V.K., and Shukla M.C., 2008, Financial Accounting –New Delhi, Sultan Chand & Sons.*

REFERENCE BOOKS:

1. *Srinivasan and Ramachandran, “Management Accounting”,* Sultan Chand & Sons Ltd, New Delhi.
2. *Jain S.P., 2010, Principles of Accountancy – Kalyani Publishers, New Delhi.*

15UMA4SA	SKILL BASED SUBJECT- II: OPERATIONS RESEARCH - II	SEMESTER- IV
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Total Credits: 3

Hours Per Week: 3

OBJECTIVE:

1. To enhance student knowledge in game theory, performance measures of queues, optimal use of Inventory.
2. To enhance student knowledge in Network scheduling with application.

CONTENTS

UNIT - I

Game Theory – Two person zero sum game – The Maxmini – Minimax principle – problems – Solution of 2×2 rectangular Games – Domination Property – $(2 \times n)$ and $(m \times 2)$ graphical method – Problems.

UNIT - II

Queueing Theory – Introduction – Queueing system – Characteristics of Queueing system – symbols and Notation – Classifications of queues – Problems in $(M/M/1) : (\infty/\text{FIFO})$; $(M/M/1) : (N/\text{FIFO})$; $(M/M/C) : (\infty/\text{FIFO})$; $(M/M/C) : (N/\text{FIFO})$ Models.

UNIT - III

Inventory control – Types of inventories – Inventory costs – EOQ Problem with no shortages – Production problem with no shortages – EOQ with shortages – Production problem with shortages – EOQ with price breaks.

UNIT - IV

Simulation – Introduction – simulation models – Event – Types of simulation – Generation of Random Numbers – Monte-carlo simulation – simulation of queueing system.

UNIT - V

Network scheduling by PERT / CPM – Introduction – Network and basic components – Rules of Network construction – Time calculation in Networks – CPM. PERT – PERT calculations – Cost Analysis – Crashing the Network – Problems.

TEXT BOOKS:

1. *Prem Kumar Gupta and Hira.S.* 1998. **Operations Research.** S. Chand & Company Ltd, RamNagar, New Delhi.
2. *Kandiswarup. Gupta, P. K and Man Mohan.*1995. **Operations Research.**S. Chand & Sons Education Publications, New Delhi, 12th Revised edition.

REFERENCE BOOK:

1. *Taha, H.A.* 2006. **Operations Research: An Introduction.** Eighth Edition. Prentice Hall of India Private Limited, New Delhi.

15UMA53A	CORE – XI: REAL ANALYSIS	SEMESTER – V
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Total Credits: 4
Hours Per Week: 5

OBJECTIVES:

1. The students should gain the knowledge about real and complex numbers, sets and metric space.
2. The students should gain the knowledge about the Riemann - Stieltjes integral

CONTENTS

UNIT - I

Least upper bound, greatest lowest bound- the Cauchy schwarz inequalities – Countable and uncountable sets- Uncountability of the real number systems- Set Algebra – Countable collections of countable sets. Elements of point set topology: Euclidean space \mathbb{R}^n –open balls and open sets in \mathbb{R}^n . The structure of open Sets in \mathbb{R}^n –closed sets and adherent points –The Bolzano –Weierstrass theorem –the Cantor intersection Theorem.

UNIT - II

Covering –Lindelof covering theorem –the Heine Borel covering theorem – Compactness in \mathbb{R}^n –Metric Spaces –point set topology in metric spaces –compact subsets of a metric space –Boundary of a set.

UNIT - III

Convergent sequences in a metric space –Cauchy sequences – Completeness sequences –complete metric Spaces. Limit of a function – Continuous functions –continuity of composite functions. Continuous complex valued and vector valued functions – Examples of continuous functions - Continuity and inverse images of open or closed sets – functions continuous on compact sets – topological mappings – Bolzano's Theorem.

UNIT - IV

Definition of derivative –Derivative and continuity –Algebra of derivatives –Roll's theorem –The mean value theorem for derivatives – Taylor's formula with remainder. Properties of monotonic functions – functions of bounded variation –total Variation –additive properties of total variation on (a, x) as a function of x – functions of bounded variation expressed as the difference of increasing functions –continuous functions of bounded variation.

UNIT - V

The Riemann - Stieltjes integral : Introduction –Notation –The definition of Riemann –Stieltjes integral –linear properties –Integration by parts – change of variable in a Riemann –stieltjes integral –Reduction to a Riemann integral.

TEXT BOOK:

1. Tom. M. APOSTOL.1990. **Mathematical Analysis**. 2nd edition. Addison-Wisely. Narosa Publishing Company, Chennai.
2. Bartle, R.G. 2000. **Introduction to Real Analysis**.3rd Edition. John Wiley and Sons Inc. New York.

REFERENCE BOOKS:

1. Rudin,W. **Principles of Mathematical Analysis**. 1976. McGraw Hill, New York.
2. Roydon, H.L. **Real Analysis** .2005.Third Edition. Prentice Hall of India.

15UMA53B	CORE - XII: MODERN ALGEBRA	SEMESTER - V
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Total Credits: 4
Hours Per Week: 5

OBJECTIVE:

1. The students should have concrete knowledge about the abstract thinking like sets, groups and rings by proving theorems.

CONTENTS

UNIT - I

Sets - mappings - Relations and binary operations - Groups: Abelian group, Symmetric group Definitions and Examples - Basic properties.

UNIT - II

Subgroups - Cyclic subgroup - Index of a group - Order of an element - Fermat theorem - A Counting Principle - Normal Subgroups and Quotient Groups.

UNIT - III

Homomorphisms - Cauchy's theorem for Abelian groups - Sylow's theorem for Abelian groups Automorphisms - Inner automorphism - Cayley's theorem, permutation groups.

UNIT - IV

Rings: Definition and Examples -Some Special Classes of Rings - Commutative ring - Field - Integral domain - Homomorphisms of Rings.

UNIT - V

Ideals and Quotient Rings - More Ideals and Quotient Rings - Maximal ideal - The field of Quotients of an Integral Domain

TEXT BOOKS:

1. *Herstein, I.N.*2003. **Topics in Algebra**. John Wiley & Sons, New York.
2. *Arumugam and Issac.* 2000. **Modern Algebra**. New Gamma Publishing House.

REFERENCE BOOKS:

1. *Surjeet Singh and Qazi Zameeruddin.*1992. **Modern Algebra**. Vikas Publishing house.
2. *Vasishtha, A.R.*1994-95. **Modern Algebra**. Krishna Prakashan Mandir, Meerut.

15UMA53C	CORE- XIII: VISUAL BASIC	SEMESTER - V
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Total Credits: 3
Hours Per Week: 4

OBJECTIVE:

1. The students should have learnt about Object related concept.
2. They learnt the concepts of Data Files

CONTENTS

UNIT - I

Introduction to VB – Event and Event Procedure – Object related concept- VB program development process- components- VB environment – opening, saving and running a VB project- VB fundamentals- constants- variables- operators- library functions.

UNIT - II

Branching and looping- logical operators – If-then – If-then-Else -Select case- For Next, Do loop, While-Wend, Stop-VB control functions – Forms and controls.

UNIT - III

Menus and dialog boxes: Building Drop down menus, Accessing menu-sub menus- Popup menus- dialog boxes. Executing and debugging a new project- Errors-Error handlers.

UNIT - IV

Procedures: Modules and procedures- sub procedures-Event procedures- Function procedures. Arrays : Characteristics-Declarations- Dynamic Arrays- Control arrays.

UNIT - V

Data Files: Characteristics-accessing and saving a file in VB –processing- Sequential Data file- Random access file-Binary files.

TEXT BOOKS:

1. *Byron S Gottfried*. 2002. **VB .Schamn's outlines**. TMH Edition.
2. *Gary Cornell*. 2013. **Visual Basic 6**. Mc Graw Hill.

REFERENCE BOOK:

1. *Mohammed Azam*.2001. **Programming with VB 6.0**. Vikas Publications.

15UMA53D	CORE -XIV: DISCRETE MATHEMATICS	SEMESTER - V
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Total Credits: 4
Hours Per Week: 5

OBJECTIVE:

1. The students should gain knowledge about the Formal languages Automata Theory
2. To know about the concept of Lattices & Boolean Algebra and Graph Theory.

CONTENTS

UNIT - I

Mathematical logic: Connections well formed formulas, Tautology, Equivalence of formulas, Tautological implications, Duality law, Normal forms, Predicates, Variables, Quantifiers, Free and bound Variables. Theory of inference for predicate calculus.

UNIT - II

Relations and functions: Composition of relations, Composition of functions, Inverse functions, one-to- one, onto, one-to-one& onto, onto functions, Hashing functions, Permutation function, Growth of functions. Algebra structures: Semi groups, Free semi groups, Monoids, Groups, Cosets, Sets, Normal subgroups, Homomorphism.

UNIT - III

Formal languages and Automata: Regular expressions, Types of grammar, Regular grammar and finite state automata, Context free and sensitive grammars.

UNIT - IV

Lattices and Boolean algebra: Partial ordering, Poset, Lattices, Boolean algebra, Boolean functions, Theorems, Minimization of Boolean functions.

UNIT - V

Graph Theories: Directed and undirected graphs, Paths, Reachability, Connectedness, Matrix representation, Euler paths, Hamiltonian paths, Trees, Binary trees simple theorems, and applications.

TEXT BOOK:

1. Tremblay, J.P. and Manohar, R.P. 1975. **Discrete Mathematical Structures with applications to computer science**. McGraw Hill.

REFERENCE BOOKS:

1. Bondy, J.A and Murty, U.S.R. 1976. **Graph Theory with Applications**. American Elsevier Publishing Company Inc., New York.
2. Chandran, A.1993. **A First Course in Graph Theory**. Macmillan.

15UMA53P	CORE LAB-IV: VISUAL BASIC	SEMESTER - V
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Total Credits: 2
Hours Per Week: 2

1. Displaying the current data and time using Library function
2. Using text box and command button, enter and display the
3. Programming to convert temperature from Fahrenheit to centigrade or vice-versa
4. Displaying the list using combo box.
5. Calculating factorial of a number.
6. Illustrating the usage of Timer control.
7. Illustrating the usage of scroll bars.
8. Writing a Program to illustrate the usage of Drop down menus.
9. Programming to illustrate the usage of menu enhancement.
10. Writing a Program to illustrate the usage of Pop-up menu.
11. Writing a Program to illustrate the usage of input boxes.
12. Finding the smallest number.
13. Finding the sine of angle.
14. Sorting the list of numbers.
15. Calculating deviations about an average.

15UMA5SA	SKILL BASED SUBJECT -III: OPERATIONS RESEARCH - III	SEMESTER - V
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Total Credits: 3
Hours Per Week: 3

OBJECTIVE:

1. To solve Integer Programming Problems, Non-linear Programming Problems and Dynamic Programming problems.
2. It also includes Markov Analysis and Decision Analysis.

CONTENTS

UNIT - I

Integer Programming Problem - Gomory's fractional cut Method - Branch Bound Method.

UNIT - II

Non-linear Programming Problems - General NLPP - Lagrange multiplier - Hessian bordered Matrix - Kuhn Tucker Condition - Problems

UNIT - III

Dynamic Programming Problem - Recursive equation approach - D.P.P Algorithm - Solution of L.P.P by D.P.P.

UNIT - IV

Markov Analysis - Stochastic process - Markov analysis Algorithm.

UNIT - V

Decision Analysis - Decision Making environment - Decisions under uncertainty - Decision under risk - Decision - Tree Analysis.

TEXT BOOKS:

1. Prem Kumar Gupta, D. S. and Hira. 1995. **Operations Research** .S. Chand& Company Ltd, Ram Nagar, New Delhi.
2. Kandiswarup, P. K. Gupta and Man Mohan. 2007. **Operations Research** S. Chand & Sons Education Publications, New Delhi.

REFERENCE BOOK:

1. *Taha, H.A.* 2006. **Operations Research: An Introduction.** Eighth Edition. Prentice Hall of India Private Limited, New Delhi.

15UMA63A	CORE - XV: COMPLEX ANALYSIS	SEMESTER - VI
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Total Credits: 4
Hours Per Week: 6

OBJECTIVES:

1. The students should gained knowledge about the origin, properties
2. To know about the concept of application of complex numbers and complex functions.

CONTENTS

UNIT - I

Analytic function - C-R equation -C-R Equation Based Simple problems- Sufficient condition - Harmonic functions.

UNIT - II

Bilinear transformation - Cross Ratio - Fixed Points - Transformation which map real axis to real axis - Unit circle to unit circle - real axis to unit circle.

UNIT - III

Complex integration- Cauchy's Integral Theorem - Cauchy's Integral formula - Derivatives of analytic function - Morera's Theorem - Cauchy's inequality - Liouville's Theorem - Fundamental Theorem of Algebra.

UNIT - IV

Taylor's Theorem - Taylor's Series - Laurent's Series - Singular points - Types of singularities -Properties of singular - Properties of singularities - Identification of singularities.

UNIT - V

Arguments Principle - Rouché's Theorem - Calculus of residue - Residue Types and Problems-Evaluation of definite integrals.

TEXT BOOKS:

1. *Durai Pandian and Laxmi Durai Pandian*. 2003. **Complex Analysis**. Emerald Publications.
2. *Arumugam,S. Thangapandi Issac.A and Somasundaram.A*. 2014. **Complex Analysis**. Scitech Publications (India) Pvt Ltd.

REFERENCE BOOKS:

1. *Durai Pandian, P and Kayalal Pachayappa*. 2014. **Complex Analysis**. S.Chand Publications

15UMA63B	CORE XVI: INTERNET AND JAVA	SEMESTER - VI
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Total Credits: 3

Hours Per Week: 5

OBJECTIVE:

1. The students should have: Learnt the basic concept of internet, mailing, HTML, Archie, telnet, ftp and IRC muds.
2. Learnt about Java fundamentals, operators and statements.

CONTENTS

UNIT - I

Introduction to Internet- Resources of Internet -hardware and software requirements of internet- Internet service providers (ISP)-Internet addressing- Mail Using mail from a shell account - Introduction to web-using the web.

UNIT - II

URLs, schemes host names and port numbers- Using the browser Hypertext and HTML- Using the web from a shell account Introduction to Usenet - Reading and posting Usenet articles- Using Usenet from a shell account- Gopher ,Veronica and Jug head- Using gopher from a shell account.

UNIT - III

Anonymous ftp- Using ftp from a shell account-archie-file type uses on the internet downloading software - mailing lists- telnet- Using telnet from a seller account talk facilities- Using talks from a shell account - talk felicities - using talks from a shell account - IRC and muds .

UNIT - IV

Features of java - java environment - comparing java with C++ - introduction to java Language -types - operators - flow control - classes - packages and interfaces.

UNIT - V

Java classes - string handling- exception handling - threads and synchronization - utilities - input / output - networking - applets - abstract windows toolkit (AWT)-imaging.

TEXT BOOKS:

1. *Harley Hahn*.1996 .**The internet complete reference**, second edition, Tata McGraw Hill.
2. *Patric Naughton*. 1996. **Java Hand Book**. Tata McGraw Hill.

15UMA63P	CORE LAB-V: INTERNET AND JAVA	SEMESTER - VI
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Total Credits: 2
Hours Per Week: 3

1. Creating a web page using HTML to display ordered and unordered list of a departmental store. .
2. Designing an advertisement with image and text using HTML tag.
3. Creating web pages for a business organization using HTML frames.
4. Creating a web site for the department with minimum links using HTML.
5. Creating a document using format and alignment tags in HTML.
6. Printing the Pascal triangle.
7. Creating and displaying a message on the windows.
8. Drawing several shapes in the created window.
9. Finding odd or even numbers among n numbers.
10. Calculating standard deviation.

15UMA6SA	SKILL BASED SUBJECT -IV: QUANTITATIVE APTITUDE	SEMESTER - VI
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Total Credits: 3
Hours Per Week:4

OBJECTIVES:

1. To enable students gain fundamental knowledge about the Mathematical skills
2. To explain the extent of the application of analytical skills.

CONTENTS

UNIT - I

Numbers – Operations on Numbers – Face Value and Place value of a digit in a numeral-Variety types of numbers – Even and Odd numbers - Prime Numbers – Composite Numbers - Tests of divisibility- H.C.F. and L.C.M. of numbers- Important facts and Formulae – Fractions – Arithmetic Operations on Fractions.

UNIT - II

Problems on Ages – Simple problems involving ages – Data sufficiency questions – Percentage – Introduction of formulae – Concept of percentage – Increase and decrease in percentage - results on population – results on depreciation.

UNIT - III

Profit and Loss – Important facts and formulae –Cost Price – Selling Price – Profit or Gain – Loss – Profit Percentage – Loss Percentage - Ratio and Proportion – Important facts and formulae – Comparison of Ratios – Compounded Ratio – Duplicate Ratio – Sub-duplicate Ratio - Triplicate Ratio - Sub-triplicate Ratio - Variation.

UNIT - IV

Time and Work – Important Facts and Formulae – Simple Interest – Principal – Interest – Number of Years – Rate of Interest – Amount.

UNIT - V

Compound Interest – Principal – Interest – Number of years – Rate of Interest – Annual – Quarterly – Half yearly – Present Worth – Different Rate of Interest for Years – Difference between Compound Interest and Simple Interest – Calendar – Odd Days – Leap year – Ordinary Year – Counting of odd days – Days of the week related to odd days.

TEXT BOOK:

1. *Agarwal, R.S.* 2010. **Quantitative Aptitude**. Revised Edition. S.Chand and Company Ltd, Ram Nagar, New Delhi -55

REFERENCE BOOK:

1. *Abhijit Guha.* 2004. **Quantitative Techniques**. S.Chand and Company Ltd, Ram Nagar, New Delhi -55

15UMA5EA	ELECTIVE- I: ASTRONOMY – I	SEMESTER – V
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Total Credits: 4
Hours Per Week: 6

OBJECTIVES:

1. The students should gain knowledge about Celestial sphere
2. The students should gain knowledge about Astronomy.

CONTENTS

UNIT - I

General description of the Solar system. Comets and meteorites – Spherical trigonometry.

UNIT- II

Celestial sphere – Pole – Equator – Zenith, nadir, meridian, Celestial co – ordinates – Diurnal motion and simple problems – Variation in length of the day – Representation of celestial objects on the celestial sphere.

UNIT - III

Dip of the horizon – perpetual day, duration of day – Latitude and Longitude – Night variations -Twilight – Geocentric parallax.

UNIT - IV

Refraction – aberration, heliocentric parallax definitions and formula – Tangent formula – Cassinis formula.

UNIT - V

Kepler's laws of planetary motion – motion of inferior and superior planets – Relation between true eccentric and mean anomalies.

TEXT BOOK:

1. *Kumaravelu and S. Susheela* .2005.**ASTRONOMY.** S.Chand and Company Ltd, Ram Nagar, New Delhi -55

15UMA5EB	ELECTIVE- I: NUMERICAL METHODS - I	SEMESTER - V
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Total Credits: 4

Hours Per Week: 6

OBJECTIVES:

1. The student gains the knowledge about solving the linear equations numerically
2. The student gains the knowledge about finding interpolation by using difference formulae.

CONTENTS

UNIT - I

The solution of numerical algebraic and transcendental Equations: Bisection method - Iteration Method - Convergence condition - Regula Falsi Method - Newton - Raphson method - Convergence Criteria - Order of Convergence.

UNIT - II

Solution of simultaneous linear algebraic equations: Gauss elimination method - Gauss Jordan method - Method of Triangularization - Crouts method - Gauss Jacobi method - Gauss Siedel method

UNIT - III

Finite Differences: Differences - operators - forward and backward difference tables - Differences of a polynomial - Factorial polynomial - Error propagation in difference table.

UNIT - IV

Interpolation (for equal intervals): Newton's forward and backward formulae - equidistant terms with one or more missing values - Central differences and central difference table - Gauss forward and backward formulae - Stirlings formula.

UNIT - V

Interpolation (for unequal intervals): Divided differences – Properties – Relations between divided differences and forward differences – Newton's divided differences formula – Lagrange's formula and inverse interpolation.

TEXT BOOKS:

1. *Kandasamy, P. Thilagavathi, K and Gunavathi, K.* 2007. **Numerical Methods**. S. Chand and Company Ltd, New Delhi.
2. *Balagurusamy, E.* 2012. **Numerical Methods**. Tata Mc.Graw Hill Publishing Co.Ltd. New Delhi.

REFERENCE BOOK:

1. *Venkataraman, M. K.* 1999. **Numerical Methods in Science and Engineering**. V Edition. National Publishing Company.

15UMA5EC	ELECTIVE- I: RDBMS AND ORACLE	SEMESTER - V
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Total Credits: 4
Hours Per Week: 6

OBJECTIVES:

1. The students should have learnt the basic concepts of DBMS and RDBMS. Learn to build a queries using SQL, PL/SQL.
2. Learnt to design a forms and reports using ORACLE Developer 2000.

CONTENTS

UNIT - I

Basic concepts of DBMS – Entities and their attribute Keys – Primary Key, secondary key, Super Key, Candidate Key, Alternative Key - Examples, Relationship – Records and files, Data independence, Views – Types of Views, Components of a DBMS, DDL, DML, DQL. Advantages and disadvantages of DBMS, RDBMS –Relational Database – Relations and their schemes –Relation representation – Integrity rules.

UNIT - II

Integrative SQL –invoking SQL plus, data manipulation in DBMS ,The ORACLE data types, two dimension matrix creation, Intersection of data into tables, data constrains, computation in expression lists used to select data, logical operation, Range searching, pattern matching, Oracle function, Grouping data from tables in SQL , Manipulating dates on SQL, joins, sub queries.

UNIT - III

PL/SQL-Introduction, The PL/SQL execution environment, the PL/SQL syntax, Understanding the PL/SQL Block structure, database triggers.

UNIT - IV

Working with forms, Basic concepts, Application development in forms, Form module, Blocks items, Canvas view windows, Creating a form, Generating and running a form, Using the Layout editor, Master form, Triggers, Data Navigation Via an Oracle form, Master detail form, Creating a master detail form, Master detail data entry screen.

UNIT - V

Working with reports ,Defining a data model for report , specify the layout of a report, use the Oracle reports interface, Creating a default tabular report, Creating computed columns, Creating user parameter, Arranging the layout, Creating a Master / Detail report, Creating a matrix report.

TEXT BOOKS:

1. *BipinDesai*. For unit 1 treatment as in **“Introduction to Database System”** chapter1, sections 4.2 and 6.5.1 and 6.5.2
2. *Ivan Bayross.2000*. treatment as in **Commercial application Development using Oracle developer**. for units 2, 3, 4, 5

RDBMS AND ORACLE LAB:

1. Creating tables and writing simple queries using
 - a. Comparison operators
 - b. Logical Operators
 - c. Set operators
 - d. Sorting and Grouping
2. Writing Queries using built in functions
3. Creation of reports using column format
4. Updating and altering tables using SQL
5. Creation of students information table and writing PL/SQL blocks to find the total, average marks and results
6. Writing a PL/SQL block to prepare the electricity bill
7. Writing a PL/SQL to split the students information table in to two, one with the passed and other with failed
8. Writing PL/SQL block to join two tables, first table contains the Roll no. and address.
9. Creating a Database Trigger to check the data validity of record.

15UMA6EA	ELECTIVE- II: ASTRONOMY - II	SEMESTER - VI
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Total Credits: 4
Hours Per Week: 6

OBJECTIVES:

1. The students should gain knowledge about Annual Parallax.
2. The students should gain knowledge about Astronomy.

CONTENTS

UNIT - I

Time: Equation of time – Siderial Time - Conversion of time – Local Mean Time – Mean Siderial Time - Seasons – Calendar.

UNIT - II

Annual Parallax – Abberation – Direct and Retrograde motion – Stationary points.

UNIT - III

Precession – Precession of the equinoxes on different kinds of years – Nutation.

UNIT - IV

The Moon – Phases of the moon – Eclipses, Ecliptic Limits – Number of Eclipses in a year.

UNIT - V

Planetary Phenomenon – Stellar Universe – The Stellar system – Constellations – Galaxy , Cluster, Nebula – Transit circle.

TEXT BOOK:

1. *Kumaravelu and Susheela Kumaravelu, S. 2007. ASTRONOMY.*
S.Chand and Company Ltd, New Delhi.

15UMA6EB	ELECTIVE- II: NUMERICAL METHODS - II	SEMESTER - VI
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Total Credits: 4
Hours Per Week: 6

OBJECTIVE:

1. The student gain the knowledge about solving the linear equations numerically
2. To find interpolation by using difference formulae.

CONTENTS

UNIT - I

Numerical differentiations: Newton's forward and backward formulae to compute the derivatives – Derivative using Stirlings formulae – to find maxima and minima of the function given the tabular values.

UNIT - II

Numerical Integration: Newton – Cote's formula – Trapezoidal rule – Simpson's 1/3rd and 3/8th rules – Gaussian quadrature – two points and three points formulae

UNIT - III

Difference Equation: Order and degree of a difference equation – solving homogeneous and non – homogeneous linear difference equations.

UNIT -IV

Taylor series method – Euler's method – improved and modified Euler method – Runge Kutta method(fourth order Runge Kutta method only)

UNIT - V

Numerical solution of O.D.E(for first order only): Milne's predictor corrector formulae – Adam-Bashforth predictor corrector formulae – solution of ordinary differential equations by finite difference method (for second order O.D.E).

TEXT BOOK:

1. *Kandasamy, P. Thilagavathi, and K .Gunavathi, K.*2007.**Numerical Methods**. S. Chand and Company Ltd, New Delhi.

REFERENCES BOOKS:

1. *Venkataraman, M. K.*1999.**Numerical Methods in Science and Engineering**. National Publishing Company.
2. *Sankara Rao, K.*2004 .**Numerical Methods for Scientists and Engineers**. 2nd Edition Prentice Hall India .

15UMA6EC	ELECTIVE- II: DIGITAL ELECTRONICS AND COMPUTER FUNDAMENTALS	SEMESTER - VI
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Total Credits: 4
Hours Per Week: 6

OBJECTIVES:

1. The student gains the knowledge about digital electronics.
2. To know about the circuits.

CONTENTS

UNIT - I

Representation of information Number System and Codes – Binary to Decimal Conversion – Decimal to Binary Conversion – Octal Numbers – Hexadecimal Numbers – ASCII Code – Excess-3 Code – Gray Code

UNIT - II

Logic circuits: Gates – AND, OR, NOT, NAND and NOR gates – Truth tables – Boolean Algebra – Karnaugh Maps – Product of sum and Sum of product methods – Don't care conditions – Multiplexers and Demultiplexers – Flip flops – RS, JK, D, T flip flops – Decoders.

UNIT - III

Shift Registers – Counters – Arithmetic circuits – Half adder – Full Adder – Half & fullSubtractor – Binary adder &Subtractor – Serial & Parallel Binary Adders – BCD Adder.

UNIT - IV

I/O devices: Punched tape – Tape readers – Alphanumeric codes – Character recognition – CRT – Output Device : Magnetic tape Output offline Operation – Error detecting and correcting codes – Printers: Dot Matrix, Laser, CRT, Keyboards – Terminals.

UNIT - V

Semiconductor Memories: ROM – RAM – Static RAM, Dynamic RAM –
Magnetic disc memories – Magnetic tape – Digital recording techniques

TEXT BOOKS:

1. *Albert Malvino and Donald P Leach*. 2003. **Digital Principles and Applications** .
2. *Bartee, T.C* . 2007.**Digital Computer fundamentals** .

15UMA6ED	ELECTIVE- III: AUTOMATA THEORY AND FORMAL LANGUAGES	SEMESTER - VI
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Total Credits: 4
Hours Per Week: 6

OBJECTIVES:

1. The student gain the knowledge about formal languages.
2. To know about automata

CONTENTS

UNIT - I

Introduction - phrase structure Grammar (PSG) - Phrase Structure languages - Context Sensitive Grammar - Context Sensitive Language - Context Free Grammar - Context Free Language - Regular Grammar - Regular Language.

UNIT - II

Closure Operations - Union - Product or concatenation - star - reflection - Substitution - Homomorphism - Intersection - Simple theorems.

UNIT - III

Context free languages - Generation Tree - ambiguity- auxiliary lemmas - Chomsky normal form.- Greibach normal form - UV theorem - self embedding property - Parikh napping.

UNIT IV

Finite state automata - Deterministic finite state automata - non Deterministic finite state automata - Rabin and Scott theory - Chomsky and Miller theorem - Closure property - Characterization of the family of regular sets - Kleene theorem.

UNIT - V

Push down automata - Introduction - Informal description - formal definitions - notations - empty store - characterization - Deterministic Push down automata - simple theorems.

TEXT BOOK:

1. *Rani Sriomoney* .1984. **Formal Languages and Automata** .The Christian Literary Society, Madras-3 Chapters 1 to 6.

REFERENCES BOOKS:

1. *Hopcroft and still man*.1995.**Formal languages and their relation automata**. Addison Wesley.
2. *Kulin, R.Y.*1993.**Automata theory. Machines and Languages**- McGraw Hill.

15UMA6EE	ELECTIVE -III: FUZZY LOGIC AND NEURAL NETWORKS	SEMESTER - VI
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Total Credits: 4
Hours Per Week: 6

OBJECTIVES:

1. To introduce the concept of soft computing to the students, to take up research projects in these areas
2. To enable the students to apply the soft computing methodologies in their fields of Work

CONTENTS

UNIT - I

Fuzzy set theory: Fuzzy versus crisp- Crisp sets: Operations on crisp sets - Properties of crisp sets - Partition and covering .Fuzzy sets: Membership function basic fuzzy set operations - Properties of fuzzy sets. Crisp relations: Cartesian product - Other crisp relations - Operations on fuzzy relations. Fuzzy relations: Fuzzy Cartesian product - Operations on fuzzy relations.

UNIT - II

Fuzzy systems: Crisp Logic: Laws of prepositional Logic- Inference in prepositional Logic. Predicate Logic : Interpretations of Predicate Logic formula - Inference in predicate Logic . Fuzzy logic : Fuzzy Quantifiers - Fuzzy inference - Fuzzy rule based System - Defuzzification Methods - Applications.

UNIT - III

Fuzzy Associative Memories : FAM an introduction - Single Association FAM: Graphical method of inference - Correlation Matrix Encoding . Fuzzy Hebb FAMS- FAM involving a rule base - FAM Rules with multiple Antecedents / Consequents: Decomposition rules. Applications.

UNIT - IV

Fundamentals Of Neural Network: Basic Concepts of Neural Networks – Human Brain – Model of an Artificial Neuron – Neural Network Architectures: Single Layer Feed Forward Network – Multilayer Feed forward Network – Recurrent Networks .Characteristic of neural Networks – Learning Methods – Taxonomy of neural Network Architectures – History of neural Network Research – Early neural Network Architectures – Rosenblatt's perceptron – ADALINE network – MADALINE Network – Some Application Domains.

UNIT - V

Back Propagation Networks: Architecture of a Back Propagation Network: The Perceptron Model – The solution – Single Layer Artificial Neural Network. Model for Multi Perceptron .Back Propagation Learning : Input Layer computation – Hidden Layer Computation Output Layer Computation –Calculation of Error – Training of neural network – Method of steepest Descent – Effect of learning Rate - Adding a Momentum Term – Back Propagation Algorithm.

TEXT BOOK

1. *Rajasekaran, S and Vijayalakshmi Pai, G.A.* 2003. **Neural Networks, Fuzzy Logic and Genetic Algorithms – Synthesis and Applications** . Prentice Hall of India Pvt. Ltd., New Delhi.

REFERENCE BOOK:

1. *Timothy and Ross, J.* 1997. **Fuzzy Logic with Engineering Applications** , McGraw Hill .

15UMA6EF	ELECTIVE -III: GRAPH THEORY	SEMESTER - VI
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Total Credits:4

Hours Per Week: 6

OBJECTIVES:

1. The students should gain knowledge about Graphs.
2. The students should know about Tournaments.

CONTENTS

UNIT - I

Graphs -Sub graphs - Degree of a vertex walks, paths and cycles in a Graphs - connectedness cut vertex and cut edge.

UNIT - II

Entorion and Hamiltonion Graphs - Algorithm for Entorion circuits - Bipartite Graphs - Trees.

UNIT - III

Matrix representation of a graph - vector spaces, associated with a graph - cycle spaces and act set spaces.

UNIT - IV

Planar graphs - Enter's theorem on planar graphs - characterization of planar graphs (no proofs) of the difficult part of the characterization.

UNIT - V

Directed graphs - Connectivity - Enteorion Digraphs - Tournaments.

TEXT BOOK:

1. *Chandran, A.1993. A First Course in Graph Theory* (Macmillan)

15UED34B	NMEC-I :MATHEMATICS FOR COMPETITIVE EXAMINATION - I	SEMESTER - III
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Total Credits: 2
Hours Per Week:2

OBJECTIVES:

1. To enable students gain fundamental knowledge about the Mathematical skills
2. To explain the extent of the application of analytical skills.

CONTENTS

UNIT - I

Numbers - Operations on Numbers - Face Value and Place value of a digit in a numeral-Variety types of numbers - Even and Odd numbers - Prime Numbers - Composite Numbers - Tests of divisibility- H.C.F. and L.C.M. of numbers

UNIT - II

Simplification - BODMAS Rule - Modulus of a Real number - Virnaculum - Fractions - Operations on fractions - Problems on Ages - Simple problems involving ages - Date sufficiency questions

UNIT - III

Percentage - Introduction of formulae - Concept of percentage - Increase and decrease in percentage - results on population - results on depreciation.

UNIT - IV

Profit and Loss - Important facts and formulae -Cost Price - Selling Price - Profit or Gain - Loss - Profit Percentage - Loss Percentage - Ratio and Proportion - Important facts and formulae - Comparison of Ratios - Compounded Ratio - Duplicate Ratio - Sub-duplicate Ratio - Triplicate Ratio - Sub-triplicate Ratio - Variation.

UNIT - V

Partnership - Time and Work – Formulas of Time, Speed, Distance - Time and Distance

TEXT BOOK:

1. *Agarwal, R.S.* 2010. **Quantitative Aptitude**. Revised Edition. S. Chand and Company Ltd, New Delhi.

REFERENCE BOOK:

1. *Abhijit Guha.* 2004, **Quantitative Techniques**. S. Chand and Company Ltd, New Delhi.

15UED44B	NMEC-II: MATHEMATICS FOR COMPETITIVE EXAMINATION - II	SEMESTER- IV
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Total Credits: 2
Hours Per Week: 2

OBJECTIVES:

1. To enable students gain fundamental knowledge about the Mathematical skills
2. To explain the extent of the application of analytical skills.

CONTENTS

UNIT - I

Problems on Trains – Speed – Distance – Time – Conversion between Kilometer and Meter – Average Speed – Boats and streams – Same Directions – Opposite Directions.

UNIT - II

Simple Interest – Principal – Interest – Number of Years – Rate of Interest – Amount. Compound Interest – Principal – Interest – Number of years – Rate of Interest – Annual – Quarterly – Half yearly – Present Worth – Different Rate of Interest for Years – Difference between Compound Interest and Simple Interest.

UNIT - III

Area – Fundamental Concepts – Formulae – Square, Rectangle, Sphere, Cone, Cylinder and Circle – Applications and Solving Problems.

UNIT - IV

Volume and Surface Areas – Fundamental Concepts – Formulae – Cube, Cuboids, Sphere, Semi Sphere, Cone and Cylinder.

UNIT -V

Calendar - Calendar – Odd Days – Leap year – Ordinary Year – Counting of odd days – Days of the week related to odd days - Permutations and Combinations – Factorial Notation – Permutations – Number of Permutations – Number of Combinations.


TEXT BOOK:

1. Agarwal , R.S.1996.**Quantitative Aptitude**. S. Chand and Company Ltd, New Delhi.

REFERENCE BOOK:

1. Abhijit Guha. 2004.**Quantitative Techniques**. S. Chand and Company Ltd, New Delhi.


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