BACHELOR OF SCIENCE - MATHEMATICS
REGULATIONS

ELIGIBILITY:

Candidate for admission to the first year of the **B.Sc. Mathematics** 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 subjects are only eligible or other examinations accepted as equivalent there to by the academic council, subject to such other conditions as may be prescribed there for. Business Mathematics, General Mathematics and Statistics subject at HSC cannot be considered as equivalent to Mathematics.
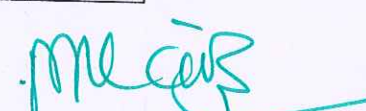
OBJECTIVE OF THE COURSE:

Mathematics is the key to success in the field of science and engineering. Today, the students need a thorough knowledge of fundamental basic principles, methods, results and a clear perception of the power of mathematical ideas and tools to use them effectively in modeling, interpreting and solving the real world problems. Mathematics plays an important role in the context of globalization of Indian economy, modern technology and we find the applications of Computers in all walks of life from Agriculture to Atomic research. This course is aimed at preparing the students to cope with the latest academic developments.

SCHEME OF EXAMINATIONS

Subject Code	Subject	Hrs of Instruction	Exam Duration (Hrs)	CA	CE	Total	Credit Points
First Semester							
Part – I							
16UTL11T/ 15UHL11H/ 15UML11M/ 15UFL11F	Tamil-I/ Hindi-I/ Malayalam-I/ French – I	6	3	25	75	100	4
Part – II							
16UEG12E	English - I	6	3	25	75	100	4
Part – III							
16UMT13A	Core- I: Classical Algebra	4	3	25	75	100	4
16UMT13B	Core - II: Calculus	5	3	25	75	100	4
16UPY1AA	Allied- I: Physics – I	4	3	20	55	75	3
	Allied Practical –I: Physics	3	-	-	-	-	-
Part – IV							
15UFC1FA	Value Education: Environmental studies	2	3	-	50	50	2
		30				525	21
Second Semester							
Part – I							
16UTL21T/ 15UHL21H/ 15UML21M/ 15UFL21F	Tamil-II/ Hindi-II/ Malayalam-II/ French – II	6	3	25	75	100	4
Part – II							
16UEG22E	English - II	6	3	25	75	100	4

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BoS Chairman/HoD
Department of Mathematics
Dr. N. G. P. Arts and Science College
Coimbatore – 641 048

	Part – III						
16UMT23A	Core -III: Analytical Geometry	4	3	25	75	100	4
16UMT23B	Core- IV: Trigonometry, Vector Calculus and Fourier Series	5	3	25	75	100	4
16UPY2AA	Allied- II: Physics – II	4	3	20	55	75	3
15UPY2AP	Allied Practical –I: Physics	3	3	20	30	50	2
	Part – IV						
15UFC2FA	Value Education: Human Rights	2	3	-	50	50	2
		30				575	23

Third Semester

	Part – I						
15UTL31U/ 15UHL31H/ 15UML31M/ 15UFL31F	Tamil-III/ Hindi-III/ Malayalam-III/ French – III	5	3	25	75	100	4
	Part – II						
16UEG32E	English - III	5	3	25	75	100	4
	Part – III						
16UMT33A	Core-V : Statics	4	3	25	75	100	4
16UMT33B/15UMT43B	Core -VI: Programming in C	2	3	10	40	50	2
16UMT33P	Core Lab -I: Programming in C	3	3	20	30	50	2
16UMT3AA	Allied- III: Statistics for Mathematics-I	4	3	25	75	100	4

	Part – IV						
	NMEC-I :	2	3	-	50	50	2
16UMT3SA	Skill Based Subject-I : Operations Research –I	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				675	27

Fourth Semester

	Part – I						
15UTL41U/ 15UHL41H/ 15UML41M/ 15UFL41F	Tamil-IV/ Hindi-IV/ Malayalam-IV/ French – IV	5	3	25	75	100	4

	Part – II						
16UEG42E	English - IV	5	3	25	75	100	4

	Part – III						
16UMT43A	Core -VII : Differential Equations and Laplace Transforms	5	3	25	75	100	4
16UMT43B	Core -VIII: Dynamics	4	3	25	75	100	4
1 6UMT4AA	Allied-IV: Statistics for Mathematics-II	4	3	25	75	100	4

	Part – IV						
	NMEC-II :	2	3	-	50	50	2
16UMT4SA	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				675	27

Fifth Semester

	Part – III						
16UMT53A	Core- IX: Real Analysis-I	5	3	20	55	75	3
16UMT53B	Core -X: Complex Analysis-I	6	3	20	55	75	3
16UMT53C	Core -XI: Modern Algebra –I	6	3	20	55	75	3
16UMT53D	Core -XII: Discrete Mathematics	5	3	25	75	100	4
	Elective – I :	5	3	25	75	100	4
	Part – IV						
16UMT5SA	Skill based subject-III : Operations Research –III	3	3	20	55	75	3
16UMT53T	Industrial Training	Grade A to C					
		30				500	20

Sixth Semester							
Part – III							
16UMT63A	Core- XIII: Real Analysis-II	5	3	20	55	75	3
16UMT63B	Core -XIV: Complex Analysis-II	6	3	20	55	75	3
16UMT63C	Core -XV: Modern Algebra - II	6	3	20	55	75	3
	Elective – II	5	3	25	75	100	4
	Elective – III	5	3	25	75	100	4
Part – IV							
16UMT6SA	Skill based subject –IV: Quantitative Aptitude	3	3	20	55	75	3
Part – V							
16UEX65A	Extension Activity	-	-	50	-	50	2
		30				550	22
Grand Total						3500	140

ELECTIVE – I

(Student shall select any one of the following subjects as Elective-I in Fifth semester)

S.No	Subject Code	Name of the Subject
1	15UMT5EA	Astronomy-I
2	15UMT5EB	Numerical Methods-I
3	16UMT5EC	Programming in C++

ELECTIVE - II

(Student shall select any one of the following subjects as Elective-II in sixth semester)

S.No	Subject Code	Name of the Subject
1.	15UMT6EA	Astronomy-II
2.	15UMT6EB	Numerical Methods-II
3.	16UMT6EC	Digital Electronics and Computer Fundamentals

ELECTIVE – III

(Student shall select any one of the following subjects as Elective-III in Sixth semester)

S.No	Subject Code	Name of the Subject
1.	15UMT6ED	Graph Theory
2.	16UMT6EE	Automata Theory & Formal Languages
3.	16UMT6EF	Fuzzy Logic and Neural Networks

NON MAJOR ELECTIVE COURSES

- The Department offers the following two papers as Non Major Elective Courses for the non mathematics major students.
- Students should opt for the following Non-major elective Courses, in order, during the third and fourth semester respectively.

S.No	Semester	Subject Code	Name of the Subject
1.	III	16UNM34B	Mathematics for Competitive Examinations-I
2.	IV	16UNM 44B	Mathematics for Competitive Examinations-II

FOR COURSE COMPLETION

Students have to complete the following subjects:

- Language papers (Tamil/Malayalam/French/Hindi, English) in I II , III and IV 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.

- Student has to complete the following industrial training :

  Subject code: 16UMA53T

  Student must undergo industrial training for 15-30 days during IV Semester summer vacation .Evaluation of the report done by the internal and external examiner in the V semester. Based on their performance grade will be awarded as A to C

  A- 75 marks and above

  B- 60-74 marks

  C-40-59 marks

  Below 40 marks. – Reappear (RA)

Total Credit Distribution

Subjects	Credits	Total		Credits	Cumulative Total
Part I: Tamil	4	4x 100 =	400	16	
Part II: English	4	4x 100 =	400	16	32
Part III:					
Core	4	8 x 100 =	800	32	
Core	3	6 x 75 =	450	18	
Core	2	1 x 50 =	50	2	
Core Lab	2	1 x 50 =	50	2	
Allied Theory	3	2 x 75 =	150	6	82
Allied Theory	4	2 x 100 =	200	8	
Allied Practical	2	1 x 50 =	50	2	
Elective	4	3 x 100 =	300	12	
Part IV:					
NMEC	2	2 x 50 =	100	4	
Skill Based Subject	3	4 x 75 =	300	12	
Foundation Courses	2	2 x 50 =	100	04	24
Value Education	2	1 x 50 =	50	02	
Environmental Studies	2	1 x 50 =	50	02	
Part V:					
Extension Activity	2		50	02	02
Total			**3500**	**140**	**140**

Earning Extra credits is not mandatory for course completion

Extra credits

Subject	Credit	Total credits
BEC/ Self study courses	1	**1**
Hindi / French/ Other foreign Language approved by certified Institutions	1	**1**
Type Writing / Short Hand Course	1	**1**
Diploma/certificate/CPT/ACS Inter/ NPTEL Course	1	**1**
Representation – Academic/Sports /Social Activities/ Extra Curricular / Co-Curricular activities at University/ District/ State/ National/ International	1	**1**
TOTAL		**5**

Rules:
The students can earn extra credits only if they complete the above course before fifth semester based on the following criteria. Proof of Completion must be submitted in the office of the Controller of Examinations before the commencement of the VI Semester. (Earning extra credits are not mandatory for Course completion)

1. Student can opt BEC course/ Self study course to earn one extra credit. They have to enroll and complete any one of the courses during their course period before the end of the successive semesters.

Self study paper offered by the department of Mathematics

S. No.	Semester	Course Code	Course Title
1.	Semester I to V	16UMTSS1	VEDIC MATHS - I
2.		16UMTSS2	VEDIC MATHS - II

2. Student can opt Hindi/ French/ Other foreign Language approved by certified Institutions to earn one credit. The certificate(Hindi) must be obtained from **Dakshina Bharat Hindi Prachar Sabha** and he/ she has to enroll and complete during their **fifth semester**

3. Student can opt for Type writing /short hand course to earn one extra credit. He/She has to enroll and complete the course during their course period to obtain certificate through **Tamil Nadu Board of Technical Education**

4. Student can opt for Diploma/certificate/CPT/ACS Inter/ NPTEL Course to earn one extra credit. Student who opt for Diploma/ Certificate course have to enroll any diploma/certificate course offered by Bharathiar University through our Institution. Student who opt for CPT/ ACS/CMA have to enroll and complete the foundation level during the course period. Students who opt for NPTEL course should complete the course certificate through NPTEL.

5. Award Winners in Academic/ Representation in Sports /Social Activities/ Extra Curricular/ Co-Curricular Activities at University/ District/ State/ National/ International level can earn one extra credit.

16UMT13A	CORE –I: CLASSICAL ALGEBRA	SEMESTER - I

Total Credits: 4
Hours Per Week: 4

OBJECTIVES:

1. On successful completion of this course the student gains knowledge about the convergence of series.

2. The student can solve algebraic equations by various methods.

CONTENTS

UNIT- I

Binomial theorem: statements and proofs – summation of series using Binomial theorem – Application of Binomial theorem to the summation series – Approximate values.

UNIT- II

Exponential theorem: Statement and proof - summation of series using Exponential theorem - Logarithmic series theorem: Modification of Logarithmic series – Euler's constant – summation of series using Logarithmic series.

UNIT- III

Convergency and Divergency of series – general theorem – series of positive terms - comparison tests - De Alembert's ratio list - Raabe's test.

UNIT- IV

Cauchy's condensation test - Cauchy's root test – absolute convergence : absolute convergence series - conditionally convergent – theorems and problems.

UNIT –V

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 - Multiple roots - Rolle's theorem - position of real roots of f(x) =0.

TEXT BOOK:

1. *Manicavachagom Pillai, T.K. Natarajan,T. and Ganapathy,K.S.* **Algebra.** Viswanatham Printers & Publishers Private Ltd. 2015.

REFERENCE BOOK:

1. *Kandasamy,P and Thilagavathy, K.* **Mathematics Branch I –Volume I.** S.Chand and Company Ltd. New Delhi. 2004.

| **16UMT13B** | **CORE- II: CALCULUS** | **SEMESTER - I** |

Total Credits:4
Hours Per Week:5

OBJECTIVES:

1. On successful completion of this course the students should have gain the knowledge about the evolutes and envelopes

2. To know about the double and triple integrals and their applications.

CONTENTS

UNIT- I

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

UNIT –II

Integration of $f'(x)/f(x)$ - $f'(x)\sqrt{f(x)}$ - $(px+q)/[\sqrt{(ax2+bx+c)}$ - $[\sqrt{(x-a)/(b-x)}]$ - $[\sqrt{(x-a)(b-x)}$ - $1/[\sqrt{(x-a)(b-x)}]$ - $1/(acosx+c)$ - $1/(asinx+c)$ - $1/(acosx+bsinx+c)$ - $1/(acos^2x+bsin^2x+c)$ - Integration by parts – definite integrals and properties.

UNIT-III

Reduction formulae- problems - evaluation of double and triple integrals – change of order of integration in double and triple integrals - applications to calculations of areas and volumes.

UNIT -IV

Jacobians - 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 BOOK:

1. *Narayanan,S and Pillai, T.K.M.* **Calculus volume I and II –** S.Viswanathan Publishers. 2009.

REFERENCE BOOKS:

1. *Bali N.P.* **Differential Calculus.** Laxmi Publisers, New Delhi. 1995.
2. *Bali N.P.* **Integral Calculus.** Laxmi Publisers, New Delhi. 2001.

| 16UPY1AA | ALLIED- I: PHYSICS-I | SEMESTER – I |

Total Credits: 3
Hours Per Week: 4

OBJECTIVES:

1. To enable the students in order to learn the basic principles, theory and concepts of mechanics, heat and sound.

2. To acquire introductory knowledge in the field of solar energy and nano sciences.

CONTENTS

UNIT- I

Gravitation: Newton's law of Gravitation-Determination of G by Boy's method-mass and density of earth – acceleration due to gravity-Determination of g by compound pendulum. **Elasticity:** Basic concepts – bending of beams – depression of cantilever- Determination of Y by uniform and non- uniform bending method- Torsion in a wire-Determination of rigidity modulus by torsional pendulum.

UNIT - II

Heat and thermodynamics : Vanderwaal's equation of state-critical constants of a gas-derivation of critical constants in terms of Vanderwaal's contants – Joule – Thomson – effect – Theory of J-K effect – properties of liquid Helium I and II.
Sound: Doppler effect – applications – determination of frequency of alternating current by Sonometer – Ultrasonics – production, properties and applications

UNIT - III

Solar Physics: Solar constant – measurement of solar radiations by Pyroheliometer and Pyranometer – general applications of solar energy – flat–plate collector – box type cooker - solar water heaters – solar photo – voltaic cells – general applications of solar cells.

UNIT - IV

Electricity: Conversion of Galvanometer into Ammeter and voltmeter – figure of merit of a galvanometer – Ballistic Galvanometer.
Magnetism: Basic concepts of magnetic materials – magnetic properties of Dia, Para and Ferro magnetic materials – Area of (B-H) loop –– Curie temperature – applications of magnetic materials.

UNIT - V

Nano materials: Introduction-Nano technology-preparation techniques-properties of Nano materials- Application of Nano materials.
Metallic glasses - Shape memory alloys-Biomaterials- Non-Linear optical materials-Applications.

BOOKS FOR STUDY:

1. *Brij Lal and Subrahmanyam N.* 2003. **Properties of Matter**, S. Chand and Co, New Delhi

2. *G. D. Rai* Fourth Edition reprint 2003. **Non -Conventional energy Sources** - Khanna Publication.

3. *Brijlal and Subrahmanyam 2004.* **Heat and Thermodynamics**, S.Chand & Co., New Delhi

4. *N. Subramanian and Brijlal N (2005). A Text Book of Sound*, S. Chand & Co, New Delhi

5. Brijlal and Subramanian (2005).**Electricity and Magnetism**, S. Chand &Co.,

6. *R. Murugesan* (2005). **Electricity and Magnetism**, S. Chand & Co.,

7. *Dieter Vollath*, **Nanomaterials: An Introduction to Synthesis, Properties and Applications**, 2nd Edition

REFERENCE BOOKS:

1. *R. Murugesan* (2005). **Properties of matter**s, Chand & Co.,

2. *Sukhatme (*2008). *Solar Energy* **Utilization**, Tata McGraw-Hill Education.

3. *D. S. Mathur* (2004). **Heat and Thermodynamics**, Chand & Co, Newdelhi.

4. *R. L. Saighal (2005*). **A Text Book of Sound**, S. Chand & Co.,

5. *D. N. Vasudeva* (2005). **Electricity and Magnetism**- S. Chand & Co.,

6. *S.Muthukumaran, Balaji (2014).***Engineering Physics -II**, Sri Krishna hi-tech Publishing company.

16UMT23A	CORE- III: ANALYTICAL GEOMETRY	SEMESTER – II

Total Credits: 4
Hours Per Week: 4

OBJECTIVES:

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, viz, sphere, cone and cylinder.

CONTENTS

UNIT - I

Analytical geometry of 2D: polar coordinates equation of a conic – directrix – chord – tangent – normal - simple problems.

UNIT - II

Analytical Geometry 3D: straight lines - coplanarity of straight line - shortest distance (S.D) - 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 - equation of a circle.

UNIT - IV

Cone and cylinder: Cone whose vertex is at the origin - envelope cone of a sphere - right circular cone - equation of a cylinder - right circular cylinder.

UNIT - V

Conicoides: Nature of a conicoide - standard equation of central coincide – enveloping cone - tangent plane-condition for tangency – director Sphere - director plane.

TEXT BOOKS:

1. *Duraipandian, P. Laxmi duraipandian and Mukilan,D*. **Analytical Geometry.** S.Chand and Company. 2003.
2. *Pillai, T.K.M. and Others*. **Analytical Geometry of 2D.** Visvanathan Publications. 2006.

REFERENCE BOOKS:

1. *Bali, N.P*. **Solid Geometry.** Laxmi Publications (P) Ltd. 2005.
2. *Khanna, M.L*. **Solid Geometry.** Jainath & Co Publishers. Meerut. 2005.

16UMT23B	CORE – IV: TRIGONOMETRY, VECTOR CALCULUS AND FOURIER SERIES	SEMESTER – II

Total Credits:4
Hours Per Week:5

OBJECTIVES:

1. On successful completion of this course the students should have gained knowledge about expansion of trigonometric functions,

2. To know about the concept of line integral, surface integral, volume integral and Fourier series.

CONTENTS

UNIT- I

Expansion of $\cos\theta, \sin\theta, \cos n\theta, \sin n\theta$ – hyperbolic functions - Separation 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 complex number - summation of trigonometric series.

UNIT- III

Differentiation of vectors – gradient, divergent and curl.

UNIT- IV

Integration of vectors – line integral – surface integral and Volume integrals – Green's theorem in the plane – Gauss divergence theorem – Strokes theorem – Simple problems.

UNIT-V

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

TEXT BOOKS:

1. *Kandasamy,P. and Thilagavathi , K.* **Mathematics for B.Sc Volume I** (Vector Calculus, Fourier Series) S.Chand & Company Ltd., 2015. For Unit III, IV & V.

2. *Kandasamy,P. and Thilagavathi , K.* **Mathematics for B.Sc Volume IV** (Vector Calculus, Fourier Series) S.Chand & Company Ltd., 2015. For Unit I & II.

REFERENCE BOOKS:

1. *Narayanan,S and Pillai, T.K.M.* **Trigonometry –**Viswanathan Publishers. 2009.

2. *Narayanan,S and Pillai, T.K.M.* **Fourier Series –**Viswanathan Publishers. 2009.

3. *Durai Pandian, P. Laxmi duraipandian and Mukilan,D.* **Vector Calculus.** S.Chand & Company Ltd., Ramnagar, New Delhi. 2003.

16UPY2AA	ALLIED –II: PHYSICS- II	SEMESTER – II

Total Credits: 3
Hours Per Week: 4

OBJECTIVES:

1. To enable the students in order to learn the basic principles, theory and concepts of Nuclear Physics and Wave Mechanics.

2. To acquire introductory knowledge in the field of Semiconductor and Laser Physics.

UNIT- I

Modern physics: Photo electric effect – Einstein's photo electric equation – verification of Einstein's photo electric equation by Millikan's experiment – photo electric cells – applications

Wave mechanics: De Broglie matter waves – calculation of De Broglie wave length – Experimental study of De Broglie matter wave by G.P.Thomson experiment.

UNIT- II

Nuclear physics : characteristics of nuclear forces – nuclear structure by liquid drop model – Binding energy – mass defect – particle accelerators – cyclotron and betatron – artificial transmutations by α – particles - nuclear Fission and nuclear Fusion (basic idea only) – elementary particles – Leptons, Mesons and Baryons

UNIT - III

Laser physics: Purity of spectral lines – Coherence length and time – spontaneous and induced emissions – population inversion – meta stable state – conditions for laser actions – Ruby laser – Helium – neon laser – applications of lasers – Raman effect – Raman shift – stokes and anti stokes lines – Laser Raman Spectrometer.

UNIT - IV

Semiconductor physics: Volt – Ampere Characteristics of P-N junction Diode – Zener diode – applications of Zener diodes - Volt – Principles of LED and LCD – Frequency Modulation and Amplitude modulation – basic principles of antennas – block diagram of monochrome TV receiver – basic principles and applications of RADAR.

UNIT - V

Integrated Electronics: Steps in fabrication of Monolithic IC's – General applications of IC's –Digital Electronics: Analog and digital computers – organization of digital computers – number systems – conversion of binary into decimal – conversion of decimal to binary – binary addition and subtraction – Basic logic gates – NAND and NOR as an universal logic gates – Demorgan's theorems – Boolean algebra –applications of Demorgan's theorems.

BOOKS FOR STUDY:

1. *R. Murugesan* (2004)**, Modern Physics ,**S. Chand & Co.

2. *M.N.Aravamudhan*, **An Introduction to Laser Theory and application**, S.Chand *& Co.*

3. *B.L. Theraja* (2000).**Basic Electronics (Solid state)**, S. Chand & Co.,

4. *Malvino & Leach*, **Digital Principles and application**, Tata-McGraw Hill Publishers

5. *V.K. Metha* , **Principles of Electronics** , S. Chand & Co.,

REFERENCE BOOKS:

1. *Gupta and Kumar ,***Handbook of Electronics**, S. Chand & Co.,

2. *R.K. Gaur* (1993), **Engineering Physics,** Dhanpat Rai & Sons.

3. *Arumugam M*(2010). *Engineering Physics*, Anuradha *publishers*.

4. *Bartee* (1985), **Digital Computer Fundamentals,** McGraw-Hill Education (India) Pvt Limited.

15UPY2AP	ALLIED PRACTICAL- I: PHYSICS	SEMESTER – II

Total Credits: 2
Hours Per Week: 3

LIST OF EXPERIMENTS:

Any 12 Experiments

1. Young's Modulus-Uniform Bending (Microscopic Method)

2. Young's Modulus-Non-uniform Bending (Microscopic Method)

3. Compound Pendulum – determination of 'g' and 'K'

4. Torsional Pendulum – Rigidity Modulus

5. Rigidity Modulus – Static Torsion

6. Spectrometer – Refractive Index of a glass Prism

7. Spectrometer – Grating- Minimum deviation & Normal Incidence

8. Moment of a Magnet – Tan C position

9. Viscosity – Poiseuille's Method

10. Meter Bridge- Temperature Coefficient of resistance

11. Meter Bridge- Specific Resistance of a material

12. Specific Heat capacity of a Liquid – Newton's method of cooling

13. Sonometer – Frequency of a tuning fork

14. Post office box- Determination of Temperature Coefficient of Resistance

15. Post office box- Determination of Specific Resistance

| 16UMT33A | CORE – V: STATICS | SEMESTER - III |

Total Credits:4
Hours Per Week:4

OBJECTIVES:

1. On successful completion of course the students should realize the concept about the forces, its resultant force acting on a surface, friction and center of gravity.

2. The study can understood the behavior of strings and chains.

CONTENTS

UNIT- I

Basic concepts and principles - forces acting on a particle: Parallelogram law of forces - triangle of forces – polygon of forces – resolution of forces.

UNIT- II

Parallel Forces - Moments – couples.

UNIT- III

Coplanar forces acting on a rigid body.

UNIT- IV

Friction: Introduction – statical, dynamical and limiting friction – laws of friction – coefficient of friction – angle of friction – cone of friction – equilibrium of a particle on a range inclined plane.

UNIT –V

Equilibrium of strings and chains.

TEXT BOOK :

1. *Kandasamy.P and Thilagavathy.K* . **Statics.** S.Chand and Company. 2016.

REFERENCE BOOK:

1. *Venkataraman, M.K.* **Statics.** Agasthiar Publications, Trichy. 1999.

16UMT33B/ 15UMT43B	CORE –VI: PROGRAMMING IN C	SEMESTER– III

Total Credits: 2
Hours Per Week: 2

OBJECTIVES:

1. On successful completion of the course the students should have: Learnt the basic structure, operators and statements of c language.

2. Learnt the decision making statements and to solve the problems based on it. Learnt arrays, functions and solve the problems regarding about it.

CONTENTS

UNIT -I

Introduction – Importance of C Basic structure of C programme - 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

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 conditional Operator –The GOTO statement.

UNIT- IV

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

UNIT -V

One and Two dimensional arrays – Initializing 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.* **Programming in ANSI C** Second Edition. Tata McGraw –Hill Publishing company limited, New Delhi. *2004.*

REFERENCE BOOK:

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

16UMT33P	**CORE LAB-I:** **PROGRAMMING IN C**	**SEMESTER– III**

Total Credits:2
Hours Per Week:3

1. Write a C program to generate 'N' Fibonacci number.

2. Write a C program to print all possible roots for a given quadratic equation.

3. Write a C program to calculate the statistical values of mean, median, mode, Standard Deviation and variance of the given data.

4. Write a C program to sort a set of numbers.

5. Write a C program to sort the given set of names.

6. Write a C program to find factorial value of a given number 'N' using recursive function call.

7. Write a C program to find the product of two given matrix.

8. Write a C program to prepare pay list for a given data.

16UMT3AA	ALLIED –III: STATISTICS FOR MATHEMATICS - I	SEMESTER - III

Total Credits: 4
Hours Per Week: 4

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

Probability- Basic concept of probability and simple problems – addition and multiplication – conditional probability – baye's theorem - 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 - 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 and continuous probability distributions: Binomial, Poisson and Normal distributions and their properties (MGF, Characteristic function, Additive properties, Mean, Variance and simple problems).

UNIT- IV

Exact sampling distributions: Chi-square distribution – some theorems on chin square distribution - Student 't' distribution - 'F' distribution their probability density functions and their properties. (MGF, CGF, Characteristic function and Additive properties) – application of the above distributions - simple problems.

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. *Gupta, S.C and Kapoor, V.K.* **Fundamentals of Mathematical statistics.** S.Chand & co. New Delhi. 2007.

REFERENCE BOOKS:

1. *Gupta ,C.B and Vijay Guptha.* **Introduction to Statistical methods.** S.Chand & Co.New Delhi. 2007.

2. Sanchetti, *D*.C. Kapoor, V.K. **Statistics.** S.Chand & Co.   New Delhi. 2010.

3. *Vittal.B.R.* **Mathematical Statistics,** Margham Publication**.** Chennai. 2015.

16UMT3SA	SKILL BASED SUBJECT- I: OPERATIONS RESEARCH -I	SEMESTER– III

Total Credits: 3
Hours Per Week: 3

OBJECTIVES:

1. On successful completion of this course students should have gained knowledge about optimal use of resources.

2. To know about the concept of the transportation Problems and Assignment Problems

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 Penality 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 - travelling salesman Problems.

TEXT BOOK:

1. *Kandiswarup, P. K. Gupta. and Man Mohan*. **Operations Research**.
   S. Chand & Sons Education Publications, New Delhi. 1998.

REFERENCE BOOK:

1. *Prem Kumar Gupta,and Hira,D.S.* **Operations Research.**
   S.Chand & Company Ltd. Ram Nagar,   New Delhi. *1998.*

16UMT43A	**CORE – VII: DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS**	**SEMESTER - IV**

Total Credits: 4
Hour Per Week: 5

OBJECTIVES:

1. On completion of this course, the students should gain the knowledge about the method of solving Differential Equations.

2. It also exposes Differential Equations 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.

UNIT -II

Linear equation of Second and Higher Order: 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 variations of parameter.

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 - 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 '(t), f ''(t)*.

UNIT –V

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

TEXT BOOK:

1. *Kandasamy, P and Thilagavathi, K*. **Mathematics for B.Sc – Branch – I Volume III**. S. Chand and Company Ltd, New Delhi. 2015.

REFERENCE BOOK:

1. *Narayanan,S. Manickavasagam Pillai*,T.K. **Calculus.** S. Viswanathan (Printers and Publishers) Pvt. Ltd, Chennai. 1991.

| **16UMT43B** | **CORE –VIII: DYNAMICS** | **SEMESTER– IV** |

Total Credits: 4
Hours Per Week: 4

OBJECTIVES:

1. On completion of this course, the student understands projectiles, velocity,acceleration,harmonic motion.

2. To know about the concept of central orbits, kinetic energy and moment of inertia.

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 – enveloping parabola.

UNIT -II

Motion under the action of central forces - velocity and acceleration in polar coordinates - Differential equation of central orbit – Pedal equations.

UNIT -III

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

UNIT -IV

Collision of Elastic bodies: Impact on a smooth sphere on a fixed plane – Direct impact of two smooth spheres - Loss of Kinetic energy due to direct impact of two smooth spheres - Oblique impact of two smooth spheres - Loss of Kinetic energy due to oblique impact of two smooth spheres.

UNIT -V

Moment of inertia: Introduction – theorem -

TEXT BOOK:

1. *Venkataraman, M.K.* **Dynamics.** 10th Edition. Agasthiar Publications. Trichy. 2002.

REFERENCES BOOKS:

1. *Dharamapadam , A.V.* **Dynamics.** S.Viswanathan Printers and Publishers Pvt., Ltd, Chennai. 2011.

2. *Vittal, P.R. Anantha Narayanan, v.* **Dynamics.** Margham Publications , Chennai. 2005.

16UMT4AA	**ALLIED-IV: STATISTICS FOR MATHEMATICS -II**	**SEMESTER– IV**

Hours Per Week: 4
Total Credits: 4

OBJECTIVE :

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 – parameter and statistic - 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 - II

Theory of Estimation: point estimation – Interval estimation – Characteristics of Estimator: consistency – unbiasedness – efficiency – sufficiency - Most efficient estimator - Neymann factorization theorem - Cramer Rao inequality – Rao - Blackwell theorem.

UNIT - III

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

UNIT - IV

Test of significance – procedure for testing of hypothesis - Tests of significance for large samples – Type - I and II errors – Test of significance - large sample test - Tests of significance for single and difference of mean – Mean - standard deviation – proportion - standard deviation and proportions – small sample tests with respective student t , chi – square and F distributions – simple problems .

UNIT - V

Small sample test: Goodness of fit χ^2 test – Tests of independence of attributes – Simple problem – t-test for single mean and difference of means – Paired t-test – Simple problems – F test for equality of two population variance – Simple problems.

TEXT BOOK:

1. *Gupta, S.C and   Kapoor, V.K.* **Fundamentals of Mathematical statistics.** S.Chand & co.NewDelhi. 2007.

REFERENCE BOOKS:

1. *Vittal.P.R*   **Mathematical Statistics** , Margham Publications, Chennai. 2015.

2. *Kapur.J.M* and *Sexena.H.C.*   **Mathematical statistics**, S.Chand & co. New Delhi. 2001.

3. *D.C.Sancheti, V.K.Kapoor*. **Statistics**, S. chand & co. New Delhi. 2010.

4. *R.S.N.Pillai, Bagavathi*. **Statistics**, S. chand & co. New Delhi. 2012.

16UMT4SA	**SKILL BASED SUBJECT –II: OPERATIONS RESEARCH - II**	**SEMESTER– IV**

Total Credits: 3
Hours Per Week: 3

OBJECTIVES :

1. On successful completion of this course students should have gained knowledge about optimal use of resources.

2. To know about the concept of Queuing Theory

CONTENTS

UNIT- I

Game Theory: Introduction - Two person zero sum game – The Maxmini – Minimax principle – problems - Solution of 2 x 2 rectangular Games – Dominance Property – (2 x n) and (m x 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) : (∞/FIFO): (M/M/1) : (N/FIFO); (M/M/C) : (∞/FIFO): (M/M/C) : (N/FIFO) Models.

UNIT -III

Inventory control: Introduction – 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

Replacement problem: Introduction – Replacement of equipment/ assets that deteriorates gradually – Replacement of equipment that fails suddenly and problems.

UNIT-V

Network scheduling by PERT / CPM: Introduction – Network and basic components – Rules of Network construction – Time calculation in CPM and PERT netwroks.

TEXT BOOK:

1. *Kandiswarup, Gupta, P. K. and Man Mohan.* **Operations Research.S**. Chand & Sons Education Publications. New Delhi. 12th Revised edition. 1995.

REFERENCE BOOK:

1. *Prem Kumar Gupta.* **Operations Research.** S. Chand & Company Ltd, Ram Nagar, New Delhi. 1995.

| **16UMT53A** | **CORE – IX: REAL ANALYSIS - I** | **SEMESTER – V** |

Total Credits: 3
Hours Per Week: 5

OBJECTIVES:

1. The students should gain the knowledge about real sets and metric space, limits and continuity.

2. The students should gain the knowledge about The Riemann - Stieltjes integral

CONTENTS

UNIT - I

The Real and Complex Number System: Introduction -The field axioms – The order axioms – Geometric representation of real numbers – Intervals – Integers – The unique factorization theorem for integers – Rational numbers – Irrational numbers – Upper bounds, maximum element, least upper bound (supremum) – The completeness axiom – Some properties of the supremum; Properties of the integers deduced from the completeness axiom – The Archimedean property of the real number system – Rational numbers with finite decimal representation – Finite decimal approximation to real numbers – Infinite decimal representation of real numbers – Absolute values and the triangle inequality – The Cauchy-Schwarz inequality – Plus and minus infinity and the extended real number system R^* .

UNIT - II

Basic Notions of Set Theory: Introduction - Notations – Ordered pairs – Cartesian product of two sets – Relations and functions – Further terminology concerning functions – One-to-one functions and inverses – Composite functions – Sequences – Similar (equinumerous) sets – Finite and Infinite sets – Countable and Uncountable sets – Uncountability of the real number system – Set algebra – Countable collection of countable sets.

UNIT - III

Elements of point set topology: Introduction - Euclidean space R^n –Open balls and open sets in R^n - The structure of open sets in R^1 - Closed sets – Adherent points – Accumulation points – Closed sets and Adherent points – The Bolzano – Weierstrass theorem – The Cantors intersection theorem.

UNIT - IV

Elements of point set topology: The Lindelof covering theorem – The Heine-Borel covering theorem – Compactness in R^n - Metric spaces – Point set topology in metric spaces – Compact subsets of a metric space – Boundary of a set.

UNIT - V

Limits and Continuity: Introduction - Convergent sequences in a metric space – Cauchy sequences – Complete metric spaces – Limit of a function – Limit of vector – valued functions – Continuous functions – Continuity of composite functions – Examples of continuous functions.

TEXT BOOK:

T. M. Apostol **, Mathematical Analysis**, Narosa Publishing Company,

Second Editon. 2002.

Chapter 1: Sections: 1.1 – 1.20

Chapter 2: Sections: 2.1 – 2.15

Chapter 3: Sections: 3.1 – 3.9

Chapter 3: Sections: 3.10 – 3.16

Chapter 4: Sections: 4.1 – 4.5, 4.7 – 4.9 , 4.11

REFERENCE BOOK:

1. *Walter Rudin*, **Principles of Mathematical Analysis**, McGraw Hill, 1976.

2. *Santhi Narayan* and *Dr. M. D. Raisinghania*, **Elements of Real Analysis**, S. Chand & Company Pvt Ltd, New Delhi.

16UMT53B	CORE -X : COMPLEX ANALYSIS - I	SEMESTER – V

Total Credits: 3
Hour Per Week: 6

OBJECTIVES:

1. The students should gained knowledge about the properties of complex plane.

2. To know about the conformal mapping, analytical functions, power series and complex integrations.

CONTENTS

UNIT –I

Complex plane: Angle between two rays – equations of straight lines and circles – elementary transformation – infinity and extended complex plane – stereographic projection – simple problems.
Sets of complex points: Closed sets – open sets – theorems on bounded infinite sets.

UNIT –II

Elementary and conformal mappings: Bilinear transformation – Special bilinear transformations – Circle and inverse points – Transformations $w = z^2, w = \sqrt{z}, w = e^z, w = \sin z \, and \, w = \cos z$ - conformal mappings – simple problems.

UNIT –III

Analytic functions: Complex functions - Limit of a function – continuity of a function – uniform continuity – differentiability and analyticity of a function – necessary conditions for differentiability – sufficient conditions for differentiability – C-R equation in polar coordinates – Simple problems.

UNIT- IV

Power Series: Power series - Absolute convergence – uniform convergence - Analyticity of the sum of power series – Uniqueness of representation of a function by a power series. **Elementary functions:** Exponential functions – lograthmic functions and function a^z - branch point – Harmonic functions – simple problems.

UNIT-V

Complex Integration: Simple rectifiable oriented curves – integration of complex functions – simple integrals using definitions – definite integrals – interior and exterior of closed curve - Simply connected region – Cauchy's fundamental theorem – integral along an arc joining two points – simple problems.

TEXT BOOK:

1. *Durai Pandian , Laxmi Durai Pandian and D.Muhilan.* **Complex Analysis**. Emerald Publications – Chennai. 2004.

   Unit I: Chapter 2 Sections 2.4 to 2.9, Chapter 3 Sections 3.1 to 3.3

   Unit II: Chapter 7 Sections 7.1 to 7.8

   Unit III: Chapter 4 Sections 4.1 to 4.8 and 4.10

   Unit IV: Chapter 6 Sections 6.1 to 6.9; and 6.12 , 6.13

   Unit V: Chapter 8 Sections 8.1 to 8.8

16UMT53C	CORE –XI: MODERN ALGEBRA- I	SEMESTER – V

Total Credits: 3
Hours Per Week: 6

OBJECTIVE:

1. The students should have knowledge on sets, groups and ring

CONTENTS

UNIT - I

Preliminary Notions: Set theory – Mappings – examples of mappings - The integers - Unique factorization theorem. **Group Theory**: Definition of group - Some examples of groups- Some preliminary lemmas.

UNIT - II

Group Theory: Subgroups – Cyclic subgroup – Lagrange's theorem- Index of a group – Order of an element – Euler theorem - Fermat theorem – A Counting Principle - Normal Subgroups and Quotient Groups.

UNIT - III

Group Theory: Homomorphisms – Fundamental theorem of homomorphism of group - Cauchy's theorem for Abelian groups – Sylow's theorem for Abelian groups - Automorphisms – Inner automorphism - Cayley's theorem - Permutation groups.

UNIT - IV

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

UNIT - V

Ring Theory: Ideals and Quotient Rings – More Ideals and Quotient Rings – Maximal ideal – The field of Quotients of an Integral Domain – Euclidean Ring.

TEXT BOOK:

Herstein, I.N. **Topics in Algebra.** John Wiley & Sons, New York. 2003.

Unit I   Chapter 1 Sections 1.1 to 1.3, Chapter 2 Sections 2.1 to 2.3

Unit II   Chapter 2 Sections 2.4 to 2.6

Unit III   Chapter 2 Sections 2.7 to 2.10

Unit IV   Chapter 3 Sections 3.1 to 3.3

Unit V   Chapter 3 Sections 3.4 to 3.6.

REFERENCE BOOKS:

1. Surjeet Singh and Qazi Zameeruddin, **Modern Algebra.** Vikas Publishing House. 1992.

2. Vasishtha, A.R, **Modern Algebra.** Krishna Prakashan Mandir, Meerut. 1994-95.

3. S. Arumugam and A.T. Isaac, **Modern Algebra.** Scitech Publications (India) Pvt.Ltd

4. S.G.Venkatachalapathy, **Modern Algebra (For B.Sc Mathematics Major)**, Margham Publications,Chennai.

16UMT53D	CORE – XII: DISCRETE MATHEMATICS	SEMESTER – V

Total Credits: 4
Hours Per Week: 5

OBJECTIVES:

1. The students should gain knowledge about the Formal languages Automata Theory

2. To know about Lattices & Boolean Algebra and Graph Theory.

CONTENTS

UNIT- I

Mathematical logic: Negation – Conjunction – Disjunction – condition – Biconditional – Well formed formulas – Tautology - Equivalence of formulas - Duality law - Tautological implications - Normal forms - Predicates, Variables, Quantifiers - Free and bound Variables - Theory of inference for predicate calculus.

UNIT -II

Relations: Properties of binary relations in a set , relation matrix and the graph of a relation , equivalence relation , composition of binary relations. **Functions:** Definition and introduction , Composition of functions, Inverse functions.

UNIT- III

Grammar and Languages: Formal definition of a language , equivalence of finite state machine.

UNIT -IV

Lattices: Definition and examples – some properties of lattices – lattices and algebraic systems – Sub lattices , Direct product and Homomorphism – some special lattices. **Boolean algebra:** Definition and examples – Sub algebra , Direct product and Homomorphism – Boolean functions – minimization of Boolean functions.

UNIT- V

Graph Theory: Basic definitions , Paths, Reachability, Connectedness, Matric representation of graphs – Trees.

TEXT BOOK:

1. *Tremblay, J.P and Manohar, R.P. Discrete* **Mathematical Structures with applications to computer science**. Mc.Graw Hill *1977.*

15UMT5EA	ELECTIVE – I: ASTRONOMY – I	SEMESTER – V

Total Credits: 4
Hours Per Week: 5

OBJECTIVES:

1. On successful completion of this course the students should gain knowledge about Astronomy.

2. To know about the concept of Kepler's Laws

CONTENTS

UNIT -I

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

UNIT- II

Celestial sphere – Celestial co – ordinates – Diurnal motion – Variation in length of the day

UNIT -III

Dip – Twilight – Geocentric parallex.

UNIT- IV

Refration – Tangent formula – Cassinis formula.

UNIT- V

Kepler's laws – Relation between true eccentric and mean anamolies.

TEXT BOOK:

1. *Kumaravelu,S and Susheela Kumaravelu.2007.***Astronomy.** S. Chand & Sons Publications, New Delhi.

15UMT5EB	ELECTIVE – I: NUMERICAL METHODS - I	SEMESTER – V

Total Credits: 4
Hours Per Week: 5

OBJECTIVES:

1. On successful completion of this course the student gain the knowledge about solving the linear equations numerically.

2. To find 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 Seidel 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 differencetable – 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 BOOK:

1. *Kandasamy. P, Thilagavathi. K and Gunavathi.,K,2007*. **Numerical methods.** S. Chand and Company Ltd, New Delhi – Revised Edition . (Chapters: 3,4,5,6,7 and 8).

REFERENCE BOOK:

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

16UMT5EC	ELECTIVE - I : PROGRAMMING IN C++	SEMESTER – V

Total Credits: 4
Hours Per Week: 5

OBJECTIVEs:

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 BOOK:

1. *Balagurusamy, E.* 2003. **Object Oriented Programming with C++.** McGraw Hill- New Delhi.

REFERENCE BOOKS:

1. *Robert Lafore .* 2001. **Object Oriented Programming in Turbo C++.** Galgotia publications Pvt.Ltd, New Delhi- 110002 .

2. *Bjarne Stroustrup*. 2001. **The C++ programming language.** Pearson Education- New Delhi.

16UMT5SA	**SKILL BASED SUBJECT – III: OPERATIONS RESEARCH - III**	**SEMESTER – V**

Total Credits: 3
Hours Per Week: 3

OBJECTIVES:

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 – Gromory's fractional cut Method – Branch Boud 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

Sequencing problem: Introduction – problem of sequencing – basic terms used in sequencing – processing n jobs through 2 machines – processing n jobs through k machines – processing of 2 jobs through k machines

UNIT- V

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

TEXT BOOK:

1. *Kandiswarup, Gupta. P. K.and Man Mohan*.**Operations Research** S. Chand & Sons Education Publications, New Delhi,2007.

REFERENCE BOOK:

1. *Prem Kumar Gupta*, and Hira, D. S.**Operations Research**.S. Chand & Company Ltd, Ram Nagar, New Delhi,1995.

16UMT63A	CORE –XIII: REAL ANALYSIS - II	SEMESTER– VI

Total Credits: 3
Hours Per Week: 5

OBJECTIVES:

1. The students should gain the knowledge about derivatives, functions of bounded variables.

2. The students should gain the knowledge about The Riemann - Stieltjes integral.

CONTENTS

UNIT - I

Limits and Continuity: Continuity and inverse images of open or closed sets – Functions continuous on compact sets – Topological mappings (homeomorphisms) – Bolzano's theorem.

UNIT - II

Limits and Continuity: Connectedness – Components of a metric space - Uniform continuity- Uniform continuity and compact sets – Fixed point theorem for contraction – discontinuities of real-valued function – Monotonic functions.

UNIT - III

Derivatives: Introduction- Definition of derivative – Derivatives and continuity – Algebra of derivatives – The chain rule – one-sided derivatives and infinite derivatives – Functions with non-zero derivative – Zero derivatives and local extrema. Rolle's Theorem – The Mean- Value theorem for derivatives –Intermediate-value theorem for derivatives – Taylor's formula with remainder.

UNIT - IV

Function 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 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 variables in a Reimann-Stieltjes Integral – Reduction to a Riemann Integral.

TEXT BOOK:

T. M. Apostol , **Mathematical Analysis**, Narosa Publishing Company,

Second Editon, 2002.

Chapter 4: Sections: 4.12 – 4.15

Chapter 4: Sections: 4.16 – 4.23

Chapter 5: Sections: 5.1 – 5.12

Chapter 6: Sections: 6.1 – 6.8

Chapter 7: Sections: 7.1 – 7.7

REFERENCE BOOK:

1. *Walter Rudin,* **Principles of Mathematical Analysis**, McGraw Hill, 1976.

2. *Santhi Narayan and Dr.M.D.Raisinghania,* **Elements of Real Analysis**, S.Chand & Company Pvt Ltd, New Delhi.

16UMT63B	CORE – XIV: COMPLEX ANALYSIS - II	SEMESTER– VI

Total Credits: 3
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

Complex integration: Cauchy's integral formula and formulas for derivatives - zeros of a function – related integral theorem – term by term differentiation and integration of uniformly convergent series – simple problems.

UNIT -II

Taylor's series and Laurent's series: Taylor's series – zeros of an analytic function – Laurent's series - Cauchy's product and division – simple problems.

UNIT –III

Singularities: Singularity – Isolated singularity – Removable singularity – Essential singularity – Behaviour of a function at an isolated singularity – determination of nature of singularity – nature of singularity at infinity – simple problems.

UNIT- IV

Residues: Residues – calculation of residues – real definite integral – simple problems.

UNIT -V

Meromorphic functions: Meromorphic functions – Function meromorphic in the extended plane – simple problems.

TEXT BOOK:

1. *Durai Pandian , Laxmi Durai Pandian and D.Muhilan*. **Complex Analysis**. Emerald Publications – Chennai. 2004.

    Unit I: Chapter 8 Sections 8.9 to 8.12

    Unit II: Chapter 9 Sections 9.1 to 9.4 and 9.13

    Unit III: Chapter 9 Sections 9.5 to 9.13

    Unit IV: Chapter 10 Sections 10.1 to 10.4

    Unit V: Chapter 11 Sections 11.1 to 11.3

16UMT63C	**CORE - XV** **MODERN ALGEBRA –II**	**SEMESTER– VI**

Total Credits: 3
Hours Per Week: 6

OBJECTIVES:

1. The students should have concrete knowledge about matrices, canonical forms,vector space and dual spaces.

2. To know about the concepts of Linear transformations by proving theorems

CONTENTS

UNIT - I

Matrices: Introduction –Transpose of a Matrix – Matrix Inverse – Symmetric and Skew - Symmetric Matrices - Hermitian and Skew - Hermitian Matrices – Orthogonal and Unitary Matrices – Rank of a Matrix – Characteristic Roots and Characteristic Vectors of a Square Matrix.

UNIT - II

Vector space: Elementary Basic Concepts –Linear Independence and Bases – Dual spaces.

UNIT - III

Vector space : Inner Product Spaces – Modules.

UNIT - IV

Linear Transformations: Algebra of Linear Transformations – Characteristic Roots – Characteristic Vectors – Matrices – canonical form: triangular form.

UNIT - V

Canonical forms: Nilpotent transformation – a decomposition of V: Jordan Form – rational canonical form.

TEXT BOOKS:

1. *R.Balakrishnan and M. Ramabadran*, **Modern Algebra**, Vikas Publishing House Pvt. Ltd,   New Delhi, (Second Revised Edition 1994) (For Units I & II)

   Unit I   : Chapter 1 Sections 1.1 to 1.3, 1.5 to 1.7

   Unit II   : Chapter 1 Sections 1.8 and 1.9 , Chapter 2 Section 2.9,
                     Chapter 3 Section 3.9

2. *I.N. Herstein*, **Topics in Algebra**, John Wiley& Sons, New York, 2003.(For Units III, IV &V)

   Unit III   : Chapter 4 Sections 4.1 and 4.2

   Unit IV   : Chapter 4 Sections 4.3 and 4.4

   Unit V   : Chapter 6 Sections 6.1 , 6.2 and 6.3

REFERENCES BOOKS:

1. *Seymour Lipschutz and Marc Lipson*, **Linear Algebra,** 3rd Edition, McGraw Hill, 2001.

2. *Surjeet Singh and Qazi Zameeruddin*, **Modern Algebra**, Vikas Publishing house,1992.

3. *A.R.Vasishtha*, **Modern Algebra**, Krishna Prakashan Mandir, Meerut,1994 – 95.

4. *S. Arumugam and A.T. Isaac*, **Modern Algebra.** Scitech Publications (India) Pvt.Ltd

5. *S.G.Venkatachalapathy*, **Modern Algebra (For B.Sc Mathematics Major)**, Margham Publications,Chennai

| **16UMT6EA** | **ELECTIVE - II - ASTRONOMY – II** | **SEMESTER– VI** |

Total Credits: 4
Hours Per Week: 5

OBJECTIVES:

1. On successful completion of this course the students should gain knowledge about Astronomy.

2. To know about the concept of Planetary.

CONTENTS

UNIT- I

Time: Equation of time – Convertion of time – Seasons – Calendar.

UNIT- II

Annual Parallax – Abberation.

UNIT- III

Precession – Nutation.

UNIT- IV

The Moon – Eclipses.

UNIT- V

Planetary Phenomenon – The Stellar system.

TEXT BOOK:

1. *Kumaravelu,S and Susheela Kumaravelu*. **Astronomy.** S. Chand & Sons Publications, New Delhi. 2007.

| **16UMT6EB** | **ELECTIVE - II:**
NUMERICAL METHODS - II | **SEMESTER– VI** |

Total Credits: 4
Hours Per Week: 5

OBJECTIVES:

1. On successful completion of this course the student gain the knowledge about solving the linear equations numerically

2. To find Taylor's method, Euler's method and RK method 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 – Gaissian 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, K and Gunavathi,K* . **Numerical methods.** S. Chand and Company Ltd, New Delhi – Revised Edition. (Chapters: 3,4,5,6,7 and 8). 2007.

REFERENCE BOOK:

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

16UMT6EC	ELECTIVE - II: DIGITAL ELECTRONICS AND COMPUTER FUNDAMENTALS	SEMESTER - VI

Total Credits: 4
Hours Per Week: 5

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.* **Digital Principles and Applications** . 2003.

2. *Bartee,* T.C . **Digital Computer fundamentals**. 2007.

16UMT6ED	ELECTIVE - III: GRAPH THEORY	SEMESTER– VI

Total Credits: 4
Hours Per Week: 5

OBJECTIVES:

1. On successful completion of this course the students should gain knowledge about Graph Theory.

2. To know about the concept of Hamiltonian Graphs.

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

Eulerian and Hamiltonian Graphs – Algorithm for Eulerian circuits – Bipartite Graphs –Trees.

UNIT- III

Matrix representation of a graph – vector spaces, associated with a graph – cycle spaces and cut set graphs.

UNIT- IV

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

UNIT- V

Directed graphs – Connectivity – Enteoriom Digraphs – Tournaments.

TEXT BOOK:

1. *Chandran,A.* **A First Course in Graph Theory.** Macmillan Publishers, 2004.

REFERENCE BOOK:

1. *Narasingh Deo.* **Graph Theory.** Prentice Hall of India. 2000.

2. *Harary.* **Graph Theory.** Narosa Publishing HQCK. 1990.

16UMT6EE	**ELECTIVE - III: AUTOMATA THEORY AND FORMAL LANGUAGES**	**SEMESTER– VI**

Total Credits: 4
Hours Per Week: 5

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.

UNIT IV

Finite state automata – Deterministic finite state automata – non Deterministic finite state automata – Rabin and Scott theorem – 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 Siromoney* .1984. **Formal Languages and Automata** .The

    Christian   Literary Society, Madras-3 Chapters 1 to 6.

16UMT6EF	ELECTIVE – III: FUZZY LOGIC AND NEURAL NETWORKS	SEMESTER - VI

Total Credits: 4
Hours Per Week: 5

OBJECTIVE:

1. To learn fuzzy sets and operating fuzzy systems

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 – Mutlilayer 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 percetron – 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 .Bank Propogation 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 Propogation Algorithm.

TEXT BOOK:

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

REFERENCE BOOK:

1. *Timothy and Ross,J.* F**uzzy Logic with Engineering Applications** , McGrow Hill . 1997.

16UMT6SA	**SKILL BASED SUBJECT –IV: QUANTITATIVE APTITUDE**	**SEMESTER - VI**

Total Credits: 3
Hours Per Week: 3

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-Various types of numbers – Even and Odd numbers - Prime Numbers – Composite Numbers - Tests of divisibility- H.C.F. and L.C.M. of numbers– Fractions – Arithmetic Operations on Fractions.

UNIT - II

Problems on Ages – Simple problems involving ages – Date 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–Cost Price – Selling Price – Profit or Gain – Loss – Profit Percentage – Loss Percentage - Ratio and Proportion– Comparison of Ratios – Compounded Ratio – Duplicate Ratio – Sub-duplicate Ratio - Triplicate Ratio - Sub-triplicate Ratio - Variation.

UNIT - IV

Time and Work – Time and distance, pipes and cisterns.

UNIT - V

Simple Interest-Compound Interest- Mensuration.

TEXT BOOK:

1. *Agarwal, R.S.* **Quantitative Aptitude.** Revised Edition. S.Chand and Company Ltd, Ram Nagar, New Delhi -55. 1990.

REFERENCE BOOK:

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

16UNM34B	NMEC–I : MATHEMATICS FOR COMPETITIVE EXAMINATIONS - I	SEMESTER – III

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 – Average – Problems on numbers.

UNIT - II

Clocks – Probability – Heights and Distances.

UNIT - III

Odd man out and Series – Allegation or Mixture – Problems on ages.

UNIT - IV

Coding and decoding – cubes and dices – Ranking and Ordering.

UNIT - V

Puzzles – Diagram related problems.

TEXT BOOK:

1. *Agarwal, R.S*. **Quantitative Aptitude.** Revised Edition. S. Chand and Company Ltd, New Delhi, 2009.

2. *Praveen, R.V*. **Quantitative Aptitude and Reasoning.** PHI learning Pvt Ltd, New Delhi, 2013.

16UNM44B	**NMEC-II: MATHEMATICS FOR COMPETITIVE EXAMINATIONS - II**	**SEMESTER– IV**

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

REFERENCE BOOK:

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

16UMTSS1	SELF STUDY PAPER – I: VEDIC MATHS - 1	SEMESTER: I TO V

Total Credits:1

UNIT-I

Simple techniques :

Subtraction from 100/1000/10000 - Normal method - Vedic method - Multiplication with a series of 9s.

UNIT-II

Remainder on dividing a number by 9

Basic method - First enhancement - Second enhancement – Verification of the product of two numbers, sum of two numbers.

UNIT-III

Operations with 11

Multiplication – Divisibility Test of numbers by 11 – Multiplication with 11

UNIT – IV

Multiplication (Nikhilam)

Secondary Bases of 50 – Secondary Bases of 500

UNIT – V

(Multiplication (Urdha Tiryak)

2-Digit Multiplication - 3-Digit Multiplication

TEXT BOOK:

1. Atul Cupta, The Power of Vedic maths, Jaico Publishing House Mumbai, 2005.

16UMTSS2	SELF STUDY PAPER – II: VEDIC MATHS - II	Semester: I to V

Total Credits:1

UNIT –I

Division :

Division by a flag of one digit (no remainder) - Division by a flag of one digit (with remainder).

UNIT-II

Simple Squares :

Numbers ending with 5 – Two numbers starting with same digit and ending digits adding upto 10

UNIT – III

Square of any number :

Definition – Dwandwa or Duplex – Square of any Number

UNIT – IV

Square root of a number - Steps – Perfect square root

UNIT – V

Cubes and Cube Roots:

Computing cubes of 2 digits numbers – Cube roots of 2 digit numbers

TEXT BOOK:

1. Atul Cupta, The Power of Vedic maths, Jaico Publishing House Mumbai, 2005.

hu/6/2016

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