



M.Sc. – MATHEMATICS
SEMESTER SCHEME

UNIVERSITY OF KOTA
MBS Marg, Swami Vivekanand Nagar,
Kota - 324 005, Rajasthan, India
Website: uok.ac.in

M.A./ M.Sc. MATHEMATICS EXAM.- 2020-21

1. The Ordinances Governing the examination in the Faculties of Arts, Fine Arts, Social Sciences, Science, Commerce, Management, Engineering, Education and Law are contained in separate booklet. The students are advised to refer to the same.
2. Changes in Statutes/ Ordinances/ Rules/ Regulations/ Syllabus and Books may, from time to time, be made by amendment or remaking, and a candidate shall, except in so far as the University determines otherwise comply with any change that applies to years he has not completed at the time of change.

Note : The decision taken by the Academic Council shall be final.

SCHEME OF EXAMINATION - 2020-21 M.A./ M.Sc. MATHEMATICS

Scheme – Semester

Duration of course

There shall be four semesters in Two consecutive academic years and two semesters in an academic year

Teaching hours :- 6 hours/week for each paper

Paper Code will stand as MATH for mathematics, 1/2/3/4 for semester number, C or O for compulsory/ optional and (i/ii/iii/iv/v/...) for paper number.

There shall be 5 Papers in each of the four semesters. Each paper has Max. 100 marks (30 marks for Internal assessment, Exam. Time duration 1 hour. and 70 marks for Main semester Exam, Duration 3 hours.) Min. Pass Marks for Internal Assessment shall be 12 and for Semester Exam. 28 for each paper .

Pattern of Question paper (Semester Exam.)

The syllabus for each theory paper is divided into five independent units and question paper for each theory will be divided into three sections as mentioned below:

Section-A : One compulsory question with 10 parts, having 2 questions from each unit,. Answer limit 20 words for each question. Each question will carry equal marks. Total marks : 10

Section-B : this section will 10 questions, 2 questions from each unit, 5 questions to be attempted, taking one from each unit, answer limit 250 words for each question. Each question will carry equal marks.

Total marks : 25

Section-C : this section will carry 05 questions. Question Number 12 will be compulsory and irrespective of units and carry 15 marks. Remaining 4 questions (question may have sub division) covering all units but not more than one question from each unit, descriptive type, 2 questions to be attempted. Each question will carry 10 marks. answer limit 500 words.

Total marks : 35

Code and nomenclature of papers

Semester I			Semester II		
Sn	Code	Name Of Paper	Sn.	Code	Name Of Paper
1	MATH 1 C(i)	ADVANCED ALGEBRA I	6	MATH 2 C(i)	ADVANCED ALGEBRA
2	MATH 1 C(ii)	COMPLEX-ANALYSIS	7	MATH 2 C(ii)	REAL ANALYSIS
3	MATH 1 C(iii)	MECHANICS	8	MATH 2 C(iii)	PARTIAL DIFFERENTIAL EQUATIONS
4	MATH 1 C(vi)	INTEGRAL EQUATIONS	9	MATH 2 C(vi)	SPECIAL FUNCTION
5	MATH 1 C(v)	NUMERICAL ANALYSIS	10	MATH 2 C(v)	DISCRETE MATHEMATICS

N.B. CANDIDATE HAS TO OPT OPTIONAL PAPER IN FOURTH SEMESTER KEEPING THE SAME PAPER NUMBER OF THIRD SEMESTER.

Semester III			Semester IV		
Sn.	Code	Name Of Paper	S n.	Code	Name Of Paper
6	MATH 3 C(vi)	FUNCTIONAL ANALYSIS I	6	MATH 4 C(vi)	FUNCTIONAL ANALYSIS II
7	MATH 3 C(vii)	TOPOLOGY I	7	MATH 4 C(vii)	TOPOLOGY II
OPTIONAL PAPERS					
1	MATH 3 O(i)	OPERATIONS RESEARCH I	1	MATH 4 O(i)	OPERATIONS RESEARCH II
2	MATH 3 O(ii)	FLUID DYNAMICS I	2	MATH 4 O(ii)	FLUID DYNAMICS II
3	MATH 3 O(iii)	MATHEMATICAL STATISTICS I	3	MATH 4 C(iii)	MATHEMATICAL STATISTICS II
4	MATH 3 O(iv)	PROGRAMMING IN C WITH ANSI FEATURES I	4	MATH 4 O(iv)	PROGRAMMING IN C WITH ANSI FEATURES II
5	MATH 3 O(v)	MATHEMATICAL MODELING I	5	MATH 4 O(v)	MATHEMATICAL MODELING II
6	MATH 3 O(vi)	RELATIVITY I	6	MATH 4 O(vi)	RELATIVITY II
7	MATH 3 O(vii)	ORTHOGONAL POLYNOMIALS	7	MATH4 O(vii)	H-FUNCTION OF ONE VARIABLE AND FRACTIONAL CALCULUS

Semester I

MATH 1 C(i) :- LINEAR ALGEBRA I

duration :- 3 Hrs.

Max. Marks: – 100

distribution of marks :- Internal assessment 30

Theory paper 70

The syllabus for each theory paper is divided into five independent units and question paper for each theory will be divided into three sections as mentioned below:

Section-A : One compulsory question with 10 parts, having 2 questions from each unit,. Answer limit 20 words for each question. Each question will carry equal marks. Total marks : 10

Section-B : this section will 10 questions, 2 questions from each unit, 5 questions to be attempted, taking one from each unit, answer limit 250 words for each question. Each question will carry equal marks. Total marks : 25

Section-C : this section will carry 05 questions. Question Number 12 will be compulsory and irrespective of units and carry 15 marks. Remaining 4 questions (question may have sub division) covering all units but not more than one question from each unit, descriptive type, 2 questions to be attempted. Each question will carry 10 marks. answer limit 500 words. Total marks : 35

Unit - I

Linear transformations, Range, Kernel, Rank-nullity theorem, Singular and nonsingular transformations, Vector space of linear transformations. Linear functional, Dual and bidual of a Vector space, Annihilators, Invariance, Projections, Adjoint of a linear transformations.

Unit-II

Matrix representation of a linear transformation, Change of Basis. Transition matrix, Similarity, Eigen values and Eigen vectors for a linear transformation, Cayley-Hamilton Theorem,

Unit - III

Minimal polynomial and minimal equation, Canonical forms, Diagonalization, Reduction to triangular form, Nilpotent transformations. Index of nilpotency. Jordan Canonical form.

Unit-IV

Bilinear form, its matrix representation and rank, Symmetric and skew symmetric bilinear forms, Quadratic form associated with a bilinear form, Symmetric matrix associated with a quadratic form. Diagonalization of a quadratic form, Hermitian form and its matrix representation, Positive definite Hermitian form.

Unit V

Inner product spaces, Cauchy-Schwartz inequality, orthogonal vectors. Orthogonal complements, orthonormal sets and bases, Bessel's inequality for a finite orthonormal set. Gram Schmidt orthogonalisation process.

References :

- | | |
|-----------------------|---|
| 1. I.N.Herstien | Topics in Linear Algebra (Wiley Eastern) |
| 2. Sharma & Vashistha | Linear Algebra (Krishna Publication) |
| 3. KHoffemn & R.Kunje | Linear Algebra (Prentice- Hall India Ltd) |
| 8. S. Lang | Linear Algebra |

MATH 1 C(ii) :- COMPLEX-ANALYSIS I

duration :- 3 Hrs. Max. Marks: – 100
distribution of marks :- Internal assessment 30 Theory paper 70

The syllabus for each theory paper is divided into five independent units and question paper for each theory will be divided into three sections as mentioned below:

Section-A : One compulsory question with 10 parts, having 2 questions from each unit,. Answer limit 20 words for each question. Each question will carry equal marks. Total marks : 10

Section-B : this section will 10 questions, 2 questions from each unit, 5 questions to be attempted, taking one from each unit, answer limit 250 words for each question. Each question will carry equal marks. Total marks : 25

Section-C : this section will carry 05 questions. Question Number 12 will be compulsory and irrespective of units and carry 15 marks. Remaining 4 questions (question may have sub division) covering all units but not more than one question from each unit, descriptive type, 2 questions to be attempted. Each question will carry 10 marks. answer limit 500 words. Total marks : 35

Unit-I

Analytic functions, Sterographic projection of complex numbers, Holomorphic complex valued functions and their inverse, Cauchy-Reimann equations ,Power series. conformal mapping. Bilinear transformations their properties and classification, Special transforms $w = z^2$, $z = \sqrt{w}$, $z = c \sin w$,

Unit-II

complex integration ,Cauchy Theorem and integral formula,Poisson's integral formula,Taylor's and Laurents series

Unit -III

Morera's Theorem. Liouville's Theorem, Maximum modulus principle, Minimal modulus principle , Schwarz's Lemma.

Unit-IV

Classification of Singularities. Branch Points, Reimann Theorem on removable Singularity, open mapping theorem Casoratti-Weirstrass theorem.

Unit - V

meromorphic functions, The argument principle. Roche's Theorem, Residues, Cauchy's residue theorem; evaluation of integrals, branches of many valued function with reference to $\arg z$, $\log z$, z^n Analytic continuation .

References :

- | | |
|---------------------|---|
| 1. Malik- Arora | Mathematical Analysis (New Age International Limited) |
| 2. Schaum Series | Complex Variable (TataMcgraw Hill) |
| 3.Churchill & Brown | Complex Analysis (TataMcgraw Hill) |
| 4. Walter Rudin | Real and Complex Analysis (TataMcgraw Hill) |

MATH 1 C(iii) MECHANICS I

duration :- 3 Hrs.

Max. Marks: – 100

distribution of marks :- Internal assessment 30

Theory paper 70

The syllabus for each theory paper is divided into five independent units and question paper for each theory will be divided into three sections as mentioned below:

Section-A : One compulsory question with 10 parts, having 2 questions from each unit,. Answer limit 20 words for each question. Each question will carry equal marks. Total marks : 10

Section-B : this section will 10 questions, 2 questions from each unit, 5 questions to be attempted, taking one from each unit, answer limit 250 words for each question. Each question will carry equal marks. Total marks : 25

Section-C : this section will carry 05 questions. Question Number 12 will be compulsory and irrespective of units and carry 15 marks. Remaining 4 questions (question may have sub division) covering all units but not more than one question from each unit, descriptive type, 2 questions to be attempted. Each question will carry 10 marks. answer limit 500 words. Total marks : 35

The syllabus for each theory paper is divided into five independent units and question paper for each theory will be divided into three sections as mentioned below:

Section-A : One compulsory question with 10 parts, having 2 questions from each unit,. Answer limit 20 words for each question. Each question will carry equal marks. Total marks : 10

Section-B : this section will 10 questions, 2 questions from each unit, 5 questions to be attempted, taking one from each unit, answer limit 250 words for each question. Each question will carry equal marks. Total marks : 25

Section-C : this section will carry 05 questions. Question Number 12 will be compulsory and irrespective of units and carry 15 marks. Remaining 4 questions (question may have sub division) covering all units but not more than one question from each unit, descriptive type, 2 questions to be attempted. Each question will carry 10 marks. answer limit 500 words. Total marks : 35

Unit-I

Moment and product of Inertia- principal axes and Momental Ellipsoid, D'Alembert's principle,

Unit II

Motion about a fixed axis, (General equation of motion).

Unit-III

Generalized Coordinates, Holonomic and Non-holonomic systems, Scleronomic and Rheonomic systems, Generalized potential. Lagrange's equations

Unit-IV

Hamilton's variables, Hamilton canonical equations, Euler's dynamical equations for the motion of a rigid about an axis .

Unit-V

Hamilton's Principle, Principle of least action. Poisson's Bracket, poisson's identity, Jacobi-Poisson Theorem, Hamilton Jacobi equations

Books Suggested

1. Gold Stein : Classical Mechanics (Narosa Publication)
2. P.P. Gupta : Rigid Dynamics (Krishna Prakashan, Meerut.)
3. M. Ray : Dynamics of Rigid Body (Student's and Friend's, Agra)

MATH 1 C(iv) INTEGRAL EQUATIONS

duration :- 3 Hrs.

Max. Marks: – 100

distribution of marks :- Internal assessment 30

Theory paper 70

The syllabus for each theory paper is divided into five independent units and question paper for each theory will be divided into three sections as mentioned below:

Section-A : One compulsory question with 10 parts, having 2 questions from each unit,. Answer limit 20 words for each question. Each question will carry equal marks. Total marks : 10

Section-B : this section will 10 questions, 2 questions from each unit, 5 questions to be attempted, taking one from each unit, answer limit 250 words for each question. Each question will carry equal marks. Total marks : 25

Section-C : this section will carry 05 questions. Question Number 12 will be compulsory and irrespective of units and carry 15 marks. Remaining 4 questions (question may have sub division) covering all units but not more than one question from each unit, descriptive type, 2 questions to be attempted. Each question will carry 10 marks. answer limit 500 words. Total marks : 35

Unit-I

Fredholm and Volterra types Linear Integral Equations, Integral Equations of the first and second kinds Solution of Fredholm Integral Equations with separable Kernels.

Unit II

Fredholm types Linear Integral Equations:- Solution by successive substitutions and successive approximations.

Unit-III

Volterra types Linear Integral Equations:- Solution by successive substitutions and successive approximations.

Unit IV

Laplace Transform :- Definition, properties, Laplace transform of derivatives. Laplace Transforms for Integrals, Inverse Laplace Transforms, convolution theorem

Unit-V

Laplace Transform :- Application to Ordinary Differential Equations and Integral Equations.

References:

1. Erwin Kreyszig	Engineering Mathematics(New Age Intern. Limited)
2. M.D.Raisinghania	Integral Transform (S. Chand Pub.)
3. Shanti Swaroop	Integral Equations (Krishna Publication Meerut)
4. Pundir & Pundir	Integral Equations and Boundary value Problems (Pragati Prakashan Meerut)
5. Gupta and Goyal	Integral Transform (Krishna Prakashan Meerut)
6. I N Snedan	Uses of Integral Transform

MATH 1 C(v) NUMERICAL ANALYSIS

duration :- 3 Hrs.

Max. Marks: – 100

distribution of marks :- Internal assessment 30

Theory paper 70

The syllabus for each theory paper is divided into five independent units and question paper for each theory will be divided into three sections as mentioned below:

- Section-A :** One compulsory question with 10 parts, having 2 questions from each unit,. Answer limit 20 words for each question. Each question will carry equal marks. Total marks : 10
- Section-B :** this section will 10 questions, 2 questions from each unit, 5 questions to be attempted, taking one from each unit, answer limit 250 words for each question. Each question will carry equal marks. Total marks : 25
- Section-C :** this section will carry 05 questions. Question Number 12 will be compulsory and irrespective of units and carry 15 marks. Remaining 4 questions (question may have sub division) covering all units but not more than one question from each unit, descriptive type, 2 questions to be attempted. Each question will carry 10 marks. answer limit 500 words. Total marks : 35.

Unit I

Solutions of Equations : Solutions and Rate of Convergence of Bisection, Secant method, Regula-falsi, N-R Methods, Chebshev method. N-R Method for non linear equation. Roots of polynomial equations -Bairstaw and Birge-Veta method, Graeffe's root square method .

Unit II

Solution of System of linear equations : Direct methods, Gauss, Gauss-Jordan, Cholesky, Partition, Triangularisation method. **Iterative methods: Jacobi, Gauss-Seidal and Relaxation Methods**

Unit III

Curve Fitting and Approximation : Least square principle, Chebshev Approximation. Matrix inversion and eigen value problem- Power methods, Jacobi method, complex eigen values.

Unit-IV

Numerical Solution of Ordinary Differential Equations : Iterative methods –improved Euler methods. Runge-Kutta methods. Predictor Corrector methods.

Unit V

Stability analysis, Difference methods for Boundary Value Problems (BVP).

References :

1. Jain-Iyenger-Jain Numerical Analysis (New Age International Limited)
2. Chauhan, Vyas & Soni Studies in Numerical Analysis (Jaipur Publishing House)
3. Vedamurthy, S.N. Iyanger Numerical Methods (Vikas Publication House)
- 4 Goyel, Mittal Numerical Analysis (Pragati Prakashan)
5. Gupta Malik Calculus of Finite Difference & Numerical Analysis

M.A/M.Sc. 2020-21 Semester II

MATH 2 C(i) :- ADVANCED ALGEBRA

duration :- 3 Hrs.

Max. Marks: – 100

distribution of marks :- Internal assessment 30

Theory paper 70

The syllabus for each theory paper is divided into five independent units and question paper for each theory will be divided into three sections as mentioned below:

Section-A : One compulsory question with 10 parts, having 2 questions from each unit,. Answer limit 20 words for each question. Each question will carry equal marks. Total marks : 10

Section-B : this section will 10 questions, 2 questions from each unit, 5 questions to be attempted, taking one from each unit, answer limit 250 words for each question. Each question will carry equal marks. Total marks : 25

Section-C : this section will carry 05 questions. Question Number 12 will be compulsory and irrespective of units and carry 15 marks. Remaining 4 questions (question may have sub division) covering all units but not more than one question from each unit, descriptive type, 2 questions to be attempted. Each question will carry 10 marks. answer limit 500 words. Total marks 35

Unit-I

Homomorphism theorems on groups, conjugate elements, classes and class equation of a finite group, Sylows Theorem. Cauchy's theorem for finite Abelian group.

Unit-II

Normal and Subnormal series, Composition series, Jordan-Holder Theorem, Solvable groups.

Unit - III

Ideals, Principal Ideal rings, Division and Euclidean algorithm for polynomials over a field, Euclidean rings and domains,

Unit IV

Unique factorization theorems, unique factorization domains. Finite field extension

Unit -V

Algebraic and Transcendental extensions, Separable and Inseparable extensions, Normal extensions, Perfect field.

References :

- | | |
|--------------------------------|--|
| 1. A.R.Vashistha | Algebra (Krishna Publications- Meerut) |
| 2. Shanti Naravan | A Text book of Modern Abstract algebra (Wiley Eastern) |
| 3. Surjeet Singh & Zameeruddin | Modern Algebra(Vikas Pub. House) |
| 4. S. Maclane and G. Birkhoff | Algebra 2nd ed. (Macmillan Co.) |
| 5. D.S.Chauhan &K.N.Singh | Studies in Algebra (JPH, Jaipur) |

MATH 2 C(ii) Real Analysis II

duration :- 3 Hrs.

Max. Marks: – 100

distribution of marks :- Internal assessment 30

Theory paper 70

The syllabus for each theory paper is divided into five independent units and question paper for each theory will be divided into three sections as mentioned below:

Section-A : One compulsory question with 10 parts, having 2 questions from each unit,. Answer limit 20 words for each question. Each question will carry equal marks. Total marks : 10

Section-B : this section will 10 questions, 2 questions from each unit, 5 questions to be attempted, taking one from each unit, answer limit 250 words for each question. Each question will carry equal marks. Total marks : 25

Section-C : this section will carry 05 questions. Question Number 12 will be compulsory and irrespective of units and carry 15 marks. Remaining 4 questions (question may have sub division) covering all units but not more than one question from each unit, descriptive type, 2 questions to be attempted. Each question will carry 10 marks. answer limit 500 words. Total marks : 35

Unit-I

Riemann- Stieltjes integral, properties of Integral and Differentiation,

Unit II

Point wise and uniform convergence of sequence & series of functions, Cauchy criterion, Weirstrass M-test, Abel and Dirchlet test for Uniform Convergence, Uniform Convergence and continuity.

Unit-III

Measurable sets , Lebesgue outer measure and measurability.

Unit IV

Measurable functions. Borel and Lebesgue measurability. Non measurable sets.

Unit-V

Convergence of sequence of measurable functions. Lebesgue integral of a bounded function.

References :

- | | |
|-----------------|---|
| 1. Malik- Arora | Mathematical Analysis (New Age International Limited) |
| 2-.H.L.Royden | Real Analysis (Macmillan Pub. Co.) |
| 3. Walter Rudin | Real and Complex Analysis (TataMcgraw Hill) |
| 4. G N.Purohit | Lebesgue measure & Integration (JPH. Jaipur) |

MATH 2 C(iii) :- PARTIAL DIFFERENTIAL EQUATIONS

duration :- 3 Hrs.

Max. Marks: – 100

distribution of marks :- Internal assessment 30

Theory paper 70

The syllabus for each theory paper is divided into five independent units and question paper for each theory will be divided into three sections as mentioned below:

Section-A : One compulsory question with 10 parts, having 2 questions from each unit,. Answer limit 20 words for each question. Each question will carry equal marks. Total marks : 10

Section-B : this section will 10 questions, 2 questions from each unit, 5 questions to be attempted, taking one from each unit, answer limit 250 words for each question. Each question will carry equal marks. Total marks : 25

Section-C : this section will carry 05 questions. Question Number 12 will be compulsory and irrespective of units and carry 15 marks. Remaining 4 questions (question may have sub division) covering all units but not more than one question from each unit, descriptive type, 2 questions to be attempted. Each question will carry 10 marks. answer limit 500 words. Total marks : 35

Unit-I

Existence and uniqueness of solution of $(dy/dx) = f(x,y)$. Examples of PDE. Classification. Canonical forms, Nonlinear First Order PDE-Complete Integrals, Envelopes,

Unit -II

Method of solving Second order PDE - separation of variable and Cauchy's problem.

Unit-III

Laplace's Equation, Heat Equation and Wave Equation upto three dimension in cartesian coordinates.

Unit - IV

Laplace's Equation, Heat Equation and Wave Equation:- upto two dimension in polar coordinates, their fundamental solutions by variable separation.

Unit V

Calculus of variations, Shortest distance, Minimum surface of revolution, Brachistochrone problem, Isoperimetric problem, Geodesic.

References :

- | | | | |
|-----------------------|---|--------------------------------|-----------------------------|
| 1. Erwin Creyszig | : | Engineering Mathematics | New Age India Ltd. |
| 2. M.D. Rai Singhania | : | Advanced Differential Equation | S.Chand Publication |
| 3. Gold Stein | : | Classical Mechanics | Narosa Publication |
| 4. P.P. Gupta | : | Rigid Dynamics | Krishna Prakashan Meerut. |
| 5. M. Ray | : | Dynamics of Rigid Body | Student's and Friend's Agra |

MATH 2 C(iv) SPECIAL FUNCTION

duration :- 3 Hrs.
distribution of marks :- Internal assessment 30

Max. Marks: – 100
Theory paper 70

The syllabus for each theory paper is divided into five independent units and question paper for each theory will be divided into three sections as mentioned below:

Section-A : One compulsory question with 10 parts, having 2 questions from each unit,. Answer limit 20 words for each question. Each question will carry equal marks. Total marks : 10

Section-B : this section will 10 questions, 2 questions from each unit, 5 questions to be attempted, taking one from each unit, answer limit 250 words for each question. Each question will carry equal marks. Total marks : 25

Section-C : this section will carry 05 questions. Question Number 12 will be compulsory and irrespective of units and carry 15 marks. Remaining 4 questions (question may have sub division) covering all units but not more than one question from each unit, descriptive type, 2 questions to be attempted. Each question will carry 10 marks. answer limit 500 words. Total marks : 35

Unit-I

The hypergeometric functions : The Gauss' hypergeometric function $F(a, c; z)$ its integral form, continuous function relations, the hypergeometric differential equation, elementary properties, simple and quadratic transformations, Gauss' and Kummer's theorems.

Unit – II

The generalised hypergeometric function ${}_pF_q(a_1, \dots, a_p, b_1, \dots, b_q; z)$, its differential equations, continuous function relations, integral forms, Saalschut's, Whipple's, Dixon's theorems, contour integral representation.

Unit- III

Bessel function : its differential equation, pure and differential recurrence relations, generating function, modified Bessel function and its properties.

Unit IV

Confluent hypergeometric function ${}_1F_1(a, b; z)$: definitions, properties, recurrence relations, Kummer's formulas.

Unit - V

Generating functions: generating functions of the form $G(2xt - t^2)$, sets generated by $e^{t\phi(xt)}$ and $A(t) \exp[-xt / (1-t)]$ and the related theorems.

References:

- 1.Special functions by E.D. Rainville, Chelsea publishing company, Bronx, New York
- 2.Special functions by Y.L.Luke, Academic press, New York, London
- 3.Special functions by M.A. Pathan, P.K. Benarji, V.B.L. Chourasia and MC. Goyal, Ramesh Book Depot, Jaipur
4. Special functions by R.K. Saxena and D.C. Gokharoo, Jaipur Publishing House, m

MATH 2 C(v) DISCRETE MATHEMATICS

NOTE : Non programmable Scientific Calculator is allowed.

duration :- 3 Hrs.

Max. Marks: – 100

The syllabus for each theory paper is divided into five independent units and question paper for each theory will be divided into three sections as mentioned below:

Section-A : One compulsory question with 10 parts, having 2 questions from each unit,. Answer limit 20 words for each question. Each question will carry equal marks. Total marks : 10

Section-B : this section will 10 questions, 2 questions from each unit, 5 questions to be attempted, taking one from each unit, answer limit 250 words for each question. Each question will carry equal marks. Total marks : 25

Section-C : this section will carry 05 questions. Question Number 12 will be compulsory and irrespective of units and carry 15 marks. Remaining 4 questions (question may have sub division) covering all units but not more than one question from each unit, descriptive type, 2 questions to be attempted. Each question will carry 10 marks. answer limit 500 words. Total marks : 35

Unit-I

Sets and Proposition: Cardinality. Mathematical Induction, Principle of inclusion and exclusion, Pigeon hole principle.

Unit II

Logic , Predicate , Validity of Statements , Quantification , Proof of Implications /Identities, Method of Proofs.

Unit III

Boolean Algebra : Boolean functions and expression, propositional calculus.
Design and Implementation of digital networks, Application to switching and Logic circuits.

Unit IV

Graph Theory : Graphs. planer graph. Eulerian and Hamiltonian Graph. Directed Graphs
Trees : Binary Tree, Binary Search Tree.

Unit-V

Lattices : Lattice and algebraic structure, duality, distributed and complemented lattice, partially ordered sets.

References

- | | |
|--------------------|---|
| 1. Schuam Series | Discrete Mathematics (Tata Mcgraw Hill) |
| 2. C.L.Liu | Elements of Discrete Mathematics (Tata McGraw Hill) |
| 3. Kenneth H Rosen | Discrete Mathematics (Tata Mcgraw Hill) |
| 4. M.k. Gupta | Discrete Mathematics (Krishna Prakashan Meerut) |