MAHARISHI MAHESH YOGI VEDIC VISHWAVIDYALAYA
DIRECTORATE OF DISTANCE EDUCATION
SCHEME FOR M.A. (Mathematics) / M.Sc. (Mathematics)

FIRST YEAR

Sub. Code	Paper	Nomenclature
1DMMATH1	I	MAHARISHI VEDIC SCIENCE – I
1DMMATH2	II	ADVANCED ABSTRACT ALGEBRA
1DMMATH3	III	REAL ANALYSIS
1DMMATH4	IV	TOPOLOGY
OPTIONAL PAPERS (ANY ONE FROM FOLLOWING)		
1DMMATH5	V	DIFFERENTIAL EQUATIONS
1DMMATH6	VI	ADVANCED DISCREET MATHEMATICS
1DMMATH7	VII	DIFFERENTIAL GEOMETRY OF MANIFOLDS

SECOND YEAR

Sub. Code	Paper	Nomenclature
2DMMATH1	I	MAHARISHI VEDIC SCIENCE – II
2DMMATH2	II	INTEGRATION THEORY AND FUNCTIONAL ANALYSIS
2DMMATH3	III	PARTIAL DIFFERENTIAL EQUATIONS & MECHANICS
OPTIONAL PAPERS (SELECT ANY THREE FROM FOLLOWING)		
2DMMATH4	IV	INTEGRAL EQUATIONS AND BOUNDARY VALUE PROBLEMS
2DMMATH5	V	THEORY OF APPROXIMATION AND LINEAR OPERATION
2DMMATH6	VI	OPERATIONS RESEARCH
2DMMATH7	VII	INTEGRAL TRANSFORMS WITH APPLICATIONS
2DMMATH8	VIII	PROGRAMMING IN C
2DMMATH9	IX	FUNDAMENTALS OF COMPUTER SCIENCE

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FIRST YEAR

Sub. Code	Paper	Nomenclature	Theory Marks	Practical Marks	Assignment Marks	Total Marks
1DMMATH1	I	MAHARISHI VEDIC SCIENCE – I	70	-	30	100
1DMMATH2	II	ADVANCED ABSTRACT ALGEBRA	70	-	30	100
1DMMATH3	III	REAL ANALYSIS	70	-	30	100
1DMMATH4	IV	TOPOLOGY	70		30	100
OPTIONAL PAPERS (ANY ONE FROM FOLLOWING)						
1DMMATH5	V	DIFFERENTIAL EQUATIONS	70	-	30	100
1DMMATH6	VI	ADVANCED DISCREET MATHEMATICS	70	-	30	100
1DMMATH7	VII	DIFFERENTIAL GEOMETRY OF MANIFOLDS	70	-	30	100

SECOND YEAR

Sub. Code	Paper	Nomenclature	Theory Marks	Practical Marks	Assignment Marks	Total Marks
2DMMATH1	I	MAHARISHI VEDIC SCIENCE – II	70	-	30	100
2DMMATH2	II	INTEGRATION THEORY AND FUNCTIONAL ANALYSIS	70	-	30	100
2DMMATH3	III	PARTIAL DIFFERENTIAL EQUATIONS & MECHANICS	70	-	30	100
OPTIONAL PAPERS (SELECT ANY THREE FROM FOLLOWING)						
2DMMATH4	IV	INTEGRAL EQUATIONS AND BOUNDARY VALUE PROBLEMS	70	-	30	100
2DMMATH5	V	THEORY OF APPROXIMATION AND LINEAR OPERATION	70	-	30	100
2DMMATH6	VI	OPERATIONS RESEARCH	70	-	30	100
2DMMATH7	VII	INTEGRAL TRANSFORMS WITH APPLICATIONS	70	-	30	100
2DMMATH8	VIII	PROGRAMMING IN C	50	20	30	100
2DMMATH9	IX	FUNDAMENTALS OF COMPUTER SCIENCE	70	-	30	100

FUNDAMENTALS OF MAHARISHI VEDIC SCIENCE

(MAHARISHI VEDIC SCIENCE – I)

PG COURSES

UNIT – I

Meaning of Guru Pujan

Name of 1-20 areas of Vedic Science & their expression in Human Physiology, detail with diagram

Consciousness – Characteristics and types

UNIT – II

Maharishi's Yoga – Principles of Yoga Asans ,A general Introduction of T.M., T.M. & T.M. Sidhi Program

Types of Speech

UNIT – III

Third law of Thermodynamics, Miessiner Effect, Maharishi Effect

UNIT – IV

Introduction to Maharishi's Vedic Swasthya Vidhan, Theories of Dincharya & Ritucharya, Theories of Ayurved.

UNIT – V

Theory of Invincibility. Introduction to Maharishi Jyotish.

Suggested Readings:

Maharishi Sandesh -1and 2 , II-His Holiness Maharishi Mahesh Yogijee

Scientific Yoga Ashanas –Dr.Satpal.

Chetna Vigyan His Holiness Maharishi Yogi Ji.

Dhyan Shailly by Brahmchari Dr. Girish Ji

ADVANCED ABSTRACT ALGEBRA

UNIT - I

Groups – Normal and Subnormal series Composition Series Jordon-Holder theorem Solvable group. Nilpotent groups.

UNIT - II

Canonical forms – Similarity of linear transformation. Invariant subspaces. Reduction to triangular farms . Nilpotent transformation . Index of nil potency. Invariants of a nilpotent transformation. The primary decomposition theorem. Jordan block and Jordon forms.

Cyclic modules simple modules Semi-simple modules. Schuler's Lemma Free modules.

UNIT - III

Field theory – Extension fields. Algebraic and transcendental extensions. Separable and Inseparable extensions. Perfect field finite field primitive elements. Algebraically closed fields . Automorphsms . of extensions, Galois extensions. Fundamental theorem of Galois theory Solution of polynomial equations by radicals. Insolvability of the general equation of degree 5 by radicals.

UNIT - IV

Noetherian and artinian modules and rings – Hilbert basis theorem. Wederbum-Artintheorem Uniforma modules, primary modules, and Noether Lasker theorem.

Smith normal form over a principal ideal domain and rank.

UNIT - V

Fundamental Structure theorem for finitely generated modules over a principal ideal domain and its applications to finitely generated abelian groups. Rational canonical form. Generalised Jordan form over any field.

REAL ANALYSIS

UNIT - I

Definition and existence of Riemann- Stielties integral, properties of the Integral, Integration and differentiation, the fundamental theorem of Calculus, integration of vector-valued functions, Rectifiable curves.

UNIT - II

Sequences and series of functions, point and uniform convergence, Cauchy criterion for uniform convergence, Weierstrass M-test, Abel's and Dirichlet's tests for uniforms convergendce and continuity , uniforms convergence and Riemann-stielties integration, uniforms convergence and differentiation, Weierstrass approximation theorem, power series, uniqueness theorem for power series, Abel's and Tauber's theorems.

UNIT - III

Functions of sereral Variables, linear transformations, Derivatives in an open subset of R", Chain rule, Partial derivatives, interchange of the order of differentiation, Derivatives of higher orders, Taylor's theorem, Inverse function theorem, Implicit function theorem, jacobians, extremum problems with constraints, lagrange's multiplier method, Differentiation of Integrals, Partitions of unity, Differential forms, Stoke's theorem.

UNIT - IV

Lebesgue outer measure. Measurable sets. Regularity. Measurable function . Borel and lebesgue measurability. Non-measurable sets.

Integration of Non-negative functions. The General integral, Integration of Series. Reimann and Lebesgue Integrals.

The Four derivatives. Functions of Bounded variation. Lebesgue Differentiation Theorem. Differentiation and Integration.

UNIT - V

Measures and outer measures, Extension of a measure. Uniqueness of Extension. Completion of a measure. Integration with respect to a measure.

The L- spaces. Convex functions, Jensen's inequality. Holder and Minkowski inequalities. Completeness of L, Convergence in Measure, Almost uniform convergence.

TOPOLOGY

UNIT - I

Countable and uncountable sets. Infinite sets and the Axiom of Choice, Cardinal numbers and its arithmetic. Schroeder-Bernstein theorem. Cantor's theorem and the continuum hypothesis. Zorn's lemma. Well-ordering theorem.

Definition and examples of topological spaces. Closed sets. Dense subsets. Neighbourhoods. Interior, exterior and boundary. Accumulation points and derived sets. Bases and sub-bases. Subspaces and relative topology.

UNIT - II

Alternate methods of defining a topology in terms of Kuratowski Closrue Operator and Neighbourhood systems.

Continuous function and homeomorphism.

First and second countable spaces. Lindelof's theorems. Separable spaces. Second Countability and Separability.

UNIT - III

Separation axioms T_0, T_1, T_2, T_3 ½ , T_4, their characterizations and basic properties. Urysotin's lemma. Tietze extension theorem.

Compactness. Continuous functions and compact sets. Basic properties of compactness. Compactness and finite-intersection property. Sequentially and countabley compact sets. Local compactness and one point compactification. Stone-vech compactification Compactness in metric . Equivalence of compactness, countable compactness and sequential compactness in metric spaces.

UNIT - IV

Connected spaces. Connectedness on the real line. Components. Locally connected space.

Tychonoff product topology in terms of standard sub-base and its characterizations. Projection maps. Separation axioms and product space. Connectedness and produces. Compactness and product spaces (Tychonoff's theorem) . Countabiltiy and product space.

Embedding and metrization. Embedding lemma and Tychonolff embedding. The Urysohn metrization theorem.

UNIT - V

Nets and filters. Topology and convergence of nets. Housdorffness and nets. Compactness and nets. Filters and their convergence. Canonical way of converting nets to filters and vice-versa. Ultra-filters and compactness.

Metrization theorems and paracompactness-local finiteness . The nagata-smirnov metrization theorem . Paracompactness. The smirnov metrization theorem.

The fundamental group and covering spaces – Homotopy of paths . The fundamental group. Covering spaces. The fundamental group of the circle and the fundamental theorem of algebra.

DIFFERENTIAL EQUATIONS

UNIT - I

Homegenous Linear Equation with Variable coefficient Simultaneous differential equation, Total differential Equation.

UNIT - II

Picard's Method of Integration, successive Approximation, Existence Theorem, Uniqueness Theorem. Existence & Uniqueness theorem (All Proof by Picard's method).

UNIT - III

Dependence on initial conditions and parameters; Preliminaries. Continuity Differentiability, Higher Order Differentiability.

Poincare-Bendixson Theory-Autonomous systems. Umlanfsatz, Index of a stationary point., Poincare-Bendixson theorem. Stability of periodic solutions, rotation point, foci, nodes and saddle points.

UNIT - IV

Linear second order equations-Preliminaries, Basic facts. Theorems of sturm. Sturm-Liovville Boundary Value Problems. Numbers of Zeros. Nonoscillatory equations and principal solutions. Nonoscillation theorems.

UNIT - V

Partial differential Equation of first & Second order. Linear partial differential Equation with constant coefficient.

ADVANCED DISCRETE MATHEMATICS

UNIT - I

Formal Ligic – Statements, Symbolic Representation and Tautologies. Quantifiers, Predicates and Validity, Propositional Logic.

Semigroups & Monoides-Definitions and Examples of Semigroups and Monoids (Including those pertaining to concatenation operation). Homomorphism of semigroups and monoids. Congruence relation and Quotient Semigroups. Subsemigroup and submonoids. Direct products Basic Homomorphism Theorem.

UNIT - II

Lattices – Lattices partially ordered. Their properties. Lattices as Algebraic system. Sublattices, Direct products, and Homomorphisms. Some Special Lattices e.g., Complete, Complemented and Distributive Lattices.

Boolean Algebras – Boolean Algebras as Lattices, Various Boolean Identitios. The Switching Algebra example. Subalgebras, Direct Products and Homomorphisms. Join-irreducible elements, Atoms and Minterms. Boolean forms and Their Equivalence. Miniterm Boolean Forms, Sum fo Products Canonical Forms. Minimization of Boolean Functions. Applications of Boolean Algebra to Switching Theory (Using AND, OR & NOT gates) The karnaugh Map method.

UNIT - III

Graph Theory – Definition of (Undirected) Graphs, Paths, Circuits, Cycle & Subgraphs. Induced Subgraphs. Degree of a vertex. Connectivity, Planar Graphs and their properties, Trees. Euler's Formula for connected planar Graphs complete & Complete Bipartite Graphs, Kuratowski's Theorem (statement only) and its use spanning Trees, Cut-sets, fundamental Cut-sets, and Cycle Minimal Spanning Trees and Kruskal's Algorithm, Matrix Representations of Graphs, Euler's Theorem on the Existence of Eulerian Paths and Circuits Directed Graphs. Indegree and Outdegree of a Vertex. Weighted undirected Graphs, Dijkstra's Algorithm. Strong Connectivity & Warshall's Algorithm. Directed Trees, Search Trees. Tree Traversals.

UNIT - IV

Introductory Computability Theory – Finite state Machine and their Transition Table Diagrams. Equivalence of Finite state Machines. Reduced Machines. Homomorphism, Finite Automata, Acceptors. Non-deterministic Finite Automata and equivalence of its power to that of Deterministic Finite Automata. Moore and Mealy Machines.

Turing Machine and Partial Recursive Functions.

UNIT - V

Grammars and Lanuage – Phrase – Structure Grammars, Rewriting Rules, Derivations, Sentential Forms. Language generated by a Grammar. Regular; Context-Free, and Context Sensitive Grammars and Language , Regular sets, Regular Expressions and the Pumping Lemma: Kleene's theorem.

Notions of Syntax Analysis, Polish Notations, Conversion of Infix Expressions to Palish Notations. The Reverse Polish Notation.

DIFFERENTIAL GEOMETRY OF MANIFOLDS

UNIT - I

Definition and examples of differentiable manifolds. Tangent spaces. Jacobian. One parameter group of transformations. Lie derivatives. Immersions and imabeddings. Distributions Exterior algebra, Exterior derivative.

UNIT - II

Topological groups. Lie groups and lie algebras, Products of two Liegroups. One parameter subgroups and exponential maps. Examples of Liegroups. Homomorphism and Isomorphism. Lie transformation groups. General linear groups. Principal fibre bundle. Linear frame bundle. Associated fibre bundle. Vector bundle . Tangent bundle. Induced bundle. Bundle homomorphisms.

UNIT - III

Riemannian manifolds Riemannian connection. Curvature tensors. Sectional Curvature. Schur's theorem Geodesics in a Riemannian manifold. Projective curvature tensor. Conformal curvature tensor.

UNIT - IV

Sub manifolds & Hypersurfaces. Normals. Gauss formulae. Weigarten equations. Lines of curvature. Generalized Gauss and Mainardi-Codazziequations.

UNIT - V

Almost Complex manifolds. Nijenhuis tensor. Contravariant and covariant almost analytic vector fields. F-connections.

SECOND YEAR

ADVANCED CONCEPTS OF MAHARISHI VEDIC SCIENCE (MAHARISHI VEDIC SCIENCE –II)

PG COURSES

UNIT – I

Name of 21-40 areas of Vedic Science & their expression in Human Physiology and detail with diagram.
Consciousness, types of consciousness, characteristics of higher stages of consciousness.

UNIT – II

Introduction to Maharishi Gandharva Veda
Introduction to Maharishi Sthapatya Ved

UNIT – III

Introduction to Maharishi Vedic Management
Fundamental Elements of Vedic Management:- Totality
Ideal Management in Indian Society (Ashram Vavstha :Cast, Religious)
Management Science and Art.

UNIT – IV

Maharishi Absolute theory of Defence.
Maharishi Absolute theory of Development.
Maharishi Absolute theory of Information.

UNIT – V

Maharishi's Swasthya Vidhan.
Scientific Research based on T.M. & T.M. Sidhi Programme.

Suggested Readings:

Maharishi Sandesh -1and 2 , II-His Holiness Maharishi Mahesh YogiJee
Scientific Yoga Ashanas –Dr.Satpal.
Chetna Vigyan His Holiness Maharishi YogiJee.
Dhyan Shailly by Brahmchari Dr. Girish Ji

INTEGRATION THEORY AND FUNCTIONAL ANALYSIS

UNIT - I

Integration Theory: Sinned measure. Hahn decomposition theorem, mutually singular measures, Radon-Nikodym theorem. Labesgue decomposition. Riesz representation theorem, Extension theorem (Caratheodory), Lebesgue-Stielitijes integral, product measures, Fubini's theorem.

UNIT - II

Baire sets. Baire measure, continuous functions with compact support. Regularity of measures on locally compact spaces. Integration of continuous function with compact support, Riez-Markoff theorem.

UNIT - III

Functional Analysis : Normed Linear Spaces, Banach Spaces with examples, Quotient space of normed linear space and its completeness, bounded linear transformations, normed linear space of bounded linear transformations, dual (conjugate) spaces with examples, natural imbedding of a normed linear space in its second dual, open mapping theorem, closed graph theorem, uniform boundedness principle and its consequences.

UNIT - IV

Finite dimensional normed spaces and subspaces, Equivalent norms, finite dimensional normed linear spaces and compactness, Riesz lemma, Hahn Banach theorem for real linear space, complex linear space, and normed linear space, Adjoint operators, Reflexive spaces, Weak convergence, weak" Convergence.

UNIT - V

Lnner product space, Hilbert space, Orthogonal Complements , Orthonormal sets, Bessel's inequality, complete orthonormal sets and passeval's identity, conjugate space H" and reflexivity of Hibert space, Adjoint of an operator on a Hilbert space , self-adjoint operators, positive, projection, normal and unitary operators.

PARTIAL DIFFERENTIAL EQUATIONS & MECHANICS

UNIT - I

Partial Differential Equations : Examples of PDE. Classification. Transport Equation – Initial Value Problem, Non homogeneous equation, Laplape's equation-Fundamental Solution, Mean value formula, Properties of solutions, Energy Methods.

Wave equation – Solution by Spherical Means, Non – Homogenous Equations, Energy Methods.

UNIT – II

Nonlinear First Order PDE – Complete Integrals, Envelopes, Characteristics, Hamilton, Jacobi Equations (Colculus of Variations, Hamilton's ODE, Legendre Transform, Hpf-Lax Formula, Weak Solutions, Uniqueness).

Representation of solutions-Separation of variables, Similarity Solutions (Plane and Travelling Waves, Solutions, Similarity under Scaling) , Fourier and Laplace Transform, Hopf – Cole Transform, Hodograph and Legendra Transform, Potential Function.

UNIT - III

Mechanics :- Analytical Dynamics : Generalized coordinates. Holonomic and Non-holonomic systems. Scleronomic and Rheonomic systems. Generalized potential. Lagrange's equations of first kind. Lagrange's equations of second kind. Uniqueness of solution. Energy equation for conservative fields.

Hamilton's variables, Donkin's theorem Hamilton canonical equations. Cyclic coordinates Routh's equations, Poisson's Bracket. Poission's Identity. Jacobi-Poisson Theorem.

UNIT - IV

Hamilton's Principle, Principle of least action. Poincare cartan Integral Invariant whittaker's equations. Jacobis equations. Statement of Lee Hwo Chung's theorem.

Hamilton-Jacobi equation. Jacobi theorem. Method of spearction of variables Largrange Brackets conoitin of canonical character of a Transformation interm of lagrange brackets and Peisson brackets. Invariance of Lagrange brackets and Poisson brackets under canonical transformations.

UNIT - V

Gravitation: Attraction and potential of rod, disc, spherical shells and sphere. Surface integral of normal attraction (application & Gauss theorem) . Laplace and Poisson equations. Workdone by self attracting systems. Distributions for a given potential. Equipotential Surfaces. Surface and solid harmonics surface density in term of surface harmonics.

INTEGRAL EQUATIONS AND BOUNDARY VALUE PROBLEMS

UNIT - I

Definitions of Integral Equations and their classification. Eigen values and Eigen functions. Fredholm integral equations of second kind with separable kemels. Reduction to a system of algebraic equations. An Approximate Method. Method of successive Approximations. Iterative scheme for fredholm Integral equations of the second kind. Conditions of uniform convergence and uniqueness of series solution. Resolvent kernel and its results. Application of Iterative Scheme to Volterra integral equations of the Second kind . Classical Fredholm Theory. Fredholm Theorems.

UNIT - II

Integral Transform Method, Fourier Transform. Laplace Transform, Convolution integral. Application to volterra integral equations with convolution – type kernels. Abel's equations. Inversion formula for singular integral equation with kenrnel of the type (h(s)-h(t)-a,O<a<1. Cauchy's Principal value of singular integrals. Solution on the Cauchy-type singular integral equation. The Hilbert kernel. Solution on the Hilbert-type singular integral equation.

UNIT - III

Symmetric kernels. Complex Hilbert Space. Orthonormal system of functions. Fundamental properties of eigen values and eigen functions for symmetric kernels. Expansion in eigen function and bilinear form. Hilbert Schmidt Theorem and some immediate consequences solutions of integral equations with sysmmetric kernels.

UNIT - IV

Definition of a boundary value problem for an ordinary differential equation of the second order and its reduction to a Fredholm integral equation of the second kind. Dirac Delta function. Green's function approach to reduce boundary value problems of a self-adjoint differential equation, with homogeneous boundary conditions to integral equation forms. Auxiliary problem satisfied by Green's function. Integral equation formulations of boundary value problems with more general and inhomogeneous boundary conditions. Modified Green's function.

UNIT - V

Integral representation formulas for the solution of the Laplace's and Poission's equations. Newtonian single-layer and double layer potentials. Interior and exterior Dirichief and Neumann boundary value problems for Laplace's equation Green's function for Laplaces's equation in a free space as well as in space boundary by a ground vessel Integral equation formulation of boundary value problems for Laplace's equation.

THEORY OF APPROXIMATION AND LINEAR OPERATION

UNIT - I

Approximation in normed spaces, Uniqueness, strict convexity, Uniform Approximation. Chebyshev polynomials, Approximation in Hilbert space. Cubic Spline Interpolation.

UNIT - II

Spectral theory in Normed linear space, resolvent set and spectrum, spectral properties of bounded linear operators. Properties of resolvent and spectrum. Spectral mapping theorem for polynomials. Spectral radius of a bounded linear operator on a complex Banach space Elementary theory of Banach algebras.

UNIT - III

General properties of compact linear operators. Spectral properties of compact linear operator on normed spaces. Bhaviours of Compact linear operators with respect to solvability of operator equations. Fredholm type theorems. Fredholm alternative theorem. Fredholm alternative for integral equations.

UNIT - IV

Spectral progerties of bounded self-objoint linear operators on a complex Hilbert space. Positive operators. Manotone sequences theorem for bounded selfadjoint operators on a complex Hibert space. Square roots of a positive operator. Projection operators. Spectral family of a bounded self-adjoint linear operator and its properties, spectral representation of bounded self adjoint linear operators. Spectral theorem.

UNIT - V

Unbounded linear operators in Hilbert space. Hellinger---Toeplitz theorem . Hilbert adjoint operators, Symmetric and self-adjoint linear operators. Closed linear operators and closures. Spectral theorem for unitary and self-adjoint linear operators. Multiplication operator and Differentiation Operator.

OPERATIONS RESEARCH

UNIT - I

Operations Research and its Scope. Linear Programming-Simplex Method. Theory of the Simplex Method. Duality and Sensitivity Analysis.

Other Algorithms for Linear Programming-Dual Simplex Method, Parametric Linear Programming . Upper Bound Technique Interior Point Algorithm. Linear Goal Programming.

UNIT - II

Transportation and Assignment Problems Network Analysis-Shortest Path Problem. Minimum Spanning Tree Problem. Maximum Flow Problem. Minimum Cost Flow Problem. Network Simplex Method. Project Planning and Control With PERT-CPM.

UNIT - III

Dynamic Programming-Deterministic and Probabilistic Dyanamic Programming . Game Theory – Two-Person, Zero-Sum Games. Games with Mixed Strategies. Graphical Solution. Solution by Linear Programming.

UNIT - IV

Integer Programming-Branch and Bound Technique, Simulation Replacement Problems, sequencing.

UNIT - V

Nonlinear Programming-One and Multi-Variable Unconstrained Optimization. Kuhn-Tucker Conditions for Constrained Optimization. Quadratic Programming . Separable Programming. Convex Programming. Non-convex Programming.

INTEGRAL TRANSFORMS WITH APPLICATIONS

UNIT - I

The laplace transforms & its inversions: Definition. Laplace transform of elementary Sectionally continuous and exponential order function including its existence, some important properties of laplace transforms of derivatives and integrals. Multiplication and division by I periodic functions. Initial and final value theorems, laplace transforms of some special functions. Definition and uniqueness theorem of inverse laplace transform. Inversion of some elementary functions, some properties of inverse laplace transform. Inverse laplace transform of derivatives and integrals. Multiplication and division by power of 's' . The convolution property. Complex inversion formula, Heaviside expansion formula, Evaluation of intergrals.

UNIT - II

Application of laplace transforms. Ordinary differential equations with constant coefficients, ordinary differential equations with variable coefficient. Simultaneous ordinary differential equations. Partial differential equations. Application to Mechanics, electrical circuits, beams. Application to solution of integral equations – integral equations of convolution type, Abel's integral equation. Integro-Differential equation, difference and differential-difference equations.

UNIT - III

Fourier Series and Integrals : Fouries series, Odd and Even functions, Half range fourier sine and cosine series complex form of fourier series, Rarseval's Identity for founer sencs finite fourier transforms, the fourier integral/at including its complex form, fourier transforms, including sine and cosine transforms convolution theorem, Parseval's identity for Fourier integrals. Relations between fourier and laplace transforms, Multiple finity fourier transform Solution of simple partial differential equations by means fof fourier transforms

UNIT - IV

Mellin and Hankel Transforms; Elementery properties of the Mellin Transforms, Mellin transforms of derivatives and Integrals Mellin-Inversion Theorem of Some. * The solution convolution Theorem integral equations. The distribution of Potntial in a wedge. Application to the summation of series. Elementary properties of Hankel transforms Hankel Inversion Jheorem, Hankel transforms of the derivatives of functions and some elementary funciotn, Relations between lourier and Hankel Transform, Parseval Relation for Hankel Transforms, the use of Hankel Transforms in the solution of simple partial differential equations.

UNIT - V

Application to Boundary value problems: Boundary value problems involving partial differential equations, on dimensional heat conduction equation, one dimerisional wave equation, longitudinal and transverse Vibration of a beam, Solution of boundary value problems by laplace transform. Simple boundary value problems with applications of fourier transform .

PROGRAMMING IN C

UNIT - I

An overview of programming. Programming Language Classification of programming Language. Procedural oriented. Object oriented programming Language, Characteristics of a good programming Language Introduction to C, Basic, Structure of C-Program Programming style Execution of C Program. C tokens, Keywords of Identifiers constants, Variables. Declaration of variable; Assigning value to variable.

UNIT - II

Operators and Expression Arithmetic , Operators, Relational Operator, Logical Operator, Assignment Operator, Increment Operator, Decrement Operator, conditional operators, Bit wise operator, special operator Arithmetic Expression, Evaluation of Expression, Operator precedence & associativity . Input and output statements. Formatted input &formatted output.

UNIT - III

Decision making and branching: it, else, nested if else, if Ladder, switch statements; ? Operator GOTO operator; Looping statement:- While, do , for Jumps in Loops Arrays, one dimensional arrays, two dimensional array, multidimensional array. Pointers, Declaration of pointer accessing the address of a variable, initiating pointers, accessing a variable through its pointer. Pointer and arrays, pointer and function, pointer and structure.

UNIT - IV

Handling of character strings, declaring and initializing string variables. String Handling functions User defined function form of C-function, Return values & their types, calling a function by value & reference Nesting of function recursion, function with array & structures and union , structure initialization array of structures, structure within structure, structure and function.

UNIT - V

File management in C, Defining & Opening a file, closing a file, Input/output operations on file Error hand I/O operator Random access to the files, Command, line argument Preprocessors- Macro substitution, ANSI editions computer control directives.

FUNDAMENTALS OF COMPUTER SCIENCE

UNIT - I

Principles of object oriented programming object oriented paradigm, Basic concept of object oriented programming, Benefits of OOPs, objected oriented language, application of OOPs. Introduction to C++, Structure of Program. Compiling & linking of C++ Program.

UNIT - II

Classes, objects ,constructor and Destructor operator overloading and type conversion, Inheritance, single Inheritance, Multilevel Inheritance, pointers, virtual functions and polymorphism Templates, class Template, function Templates, New ANSI C++ features object oriented systems development procedure oriented paradigm, Development Tools, object oriented paradigm.

UNIT - III

Introduction to data base systems, operational Data, Data independence, data base system architecture Relational approach to data structures Relations, Domain and attributes, keys, Extension, Relational Data manipulations, Relational Algebra and relational calculus. SQL – basic features, Integrity constraints Database design – Normalization up to BCNF.

UNIT - IV

Data structure –Date types – Classification of data structure linked lists, stalk & Queues, Operation of Lists Stack & Queues, Algorithm for lists stack & Queue Trees properties of tree, Types : - Binary, Binary search, Tree, B-Tree Hashing Techniques Sorting Techniques – Selection sorts Bubble sort, Quick sort, heap sort.

UNIT - V

Operating system, Services: offered classification of O/S Function of O/S process Management, file Management Memory Management I/O Management concept of virtual memory, security threads protection intruders; virus trusted system, Introduction to Distributed systems.