MOHANLAL SUKHADIA UNIVERSITY, UDAIPUR

M. A. / M. Sc. MATHEMATICS (FINAL)

2016-17

Non-Collegiate

Note- There will be five papers in all. Paper-I: Topology and Functional Analysis and Paper-II: Discrete Mathematics will be compulsory. Each paper will be assigned six hours per week.

Paper I	Topology and Functional Analysis	100	3 Hrs.	6
Paper II	Discrete Mathematics	100	3 Hrs.	6

Optional Papers

Any three of the following paper with the permission of the Head of the Department of Mathematics & Statistics.

Paper III	Relativity and Cosmology	100	3 Hrs.	6
Paper IV	Viscous Fluid Dynamics	100	3 Hrs.	6
Paper V	Number theory	100	3 Hrs.	6
Paper VI	Numerical Analysis	100	3 Hrs.	6
Paper VII	Integral Equations and Internal Transforms	100	3 Hrs.	6
Paper VIII	Optimization Techniques	100	3 Hrs.	6
Paper IX	Advanced Topology	100	3 Hrs.	6
Paper X	Computer Programming	Th. 75 Per. 25	3 Hrs. 2 Hrs.	Th. 04 Pre. 02
Paper XI	Mathematical Theory of Statistics	100	3 Hrs.	6
Paper XII	Space Dynamics	100	3 Hrs.	6
Paper XIII	Astronomy	100	3 Hrs.	6
Paper XIV	Compressible Fluids and Magneto hydro Dynamics	100	3 Hrs.	6

Note:

* **Scheme of Examination:**

Question Paper Pattern for Examination: 100 marks

Section A: Total 10 Question will be set from five units i.e. two question from each unit. These questions require very short answer. Each question will be of one (1) mark (Total 10 marks). All the questions in section A are compulsory.

Section B: Total 10 questions will be set from five units i.e. two question from each unit. Students are required to attempt at least one question from each unit. Each question carries 10 marks (Total 50 marks). The answer of each question should be given approximately in 250 words.

Section C: Total 4 descriptive question will be set from five units of the paper, not more than one question from each unit. Each question may also have two sub-division. Students are required to answer two questions in about 500 words. Each question carries 20 marks (Total 40 marks).

** The right to information act, 2005 is applicable.

PAPER-VII

INTEGRAL EQUATIONS AND INTEGRAL TRANSFORMS

TIME: 3 hours **Max. Marks: 100**

UNIT – I

Linear Integral equations: Definition and classification, Conversion of initial and boundary value problem to an integral equation, Eigen values and Eigen functions, Solution of fredholm integral equations of second kind with seperable kernels. Reduction to a system of Algebraic equations.

Solution of Fredholm and Voltera integral equations of second kind by method successive substitution and successive approximations . Resolvenlt Kernal and its applications.

UNIT- II

Condition of uniform convergence and uniqueness of series solutions.

Integral Equation with symmetric kernels: Complex Hilbert space,Orthogonal system of functions. Fundamental Properties of Eigen values and Eigen functions for symmetric Kernels, Expansion in Eigen- functions and Bilinear form. Hilbert – Schmidt theorem, Solution of Fredholm integral equations of second kind with symmetric Kernels. Classical–Fredholm theory. Fredholm theorems, Solution of volterra integral equations with convolution type Kernels and Abel equations by Laplace tranform.

UNIT –III

Laplace transform: Definition and its properties. Rules of manipulations, Laplace theorms of derivatives and integrals , Properties of inverse laplace transtorms, Convolution theorm, Complex inversion formuls , applications to the solutions of ordinary differential equations with constant and variable coefficients and simple boundary value problems.

UNIT –IV

Fourier Transform: Definition and properties of fourier sine and cosine and complex transforms, Convolution theorm, Inversion theorms and Fouries transform of derivations. Applications to the solution by the partial differintial equations.

UNIT – V

Millin Transform: Definition and elementary properties, Mellin transforms of derivations and integrals Inversion theorm and convolution theorem.

Infinite Hankel transform: Definition and Elementary Properties, Hankel transform of derivations, Inversion theorem and parseval theorem. Application to the Solution of simple boundary value problems.

Books Recommended:

1. Ranville, E.D. : Laplace and Fourier Transforms.
2. Sneddon, I.N. : The use of Integral Transforms.
3. Ze manian, A.H. : Generalized Integral transforms.
4. Lowit, : Linear Integral equations.