

MOHANLAL SUKHADIA UNIVERSITY, UDAIPUR

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

2016-17

Non-Collegiate

All papers are compulsory

Paper	Paper Name	Max. Marks	Exam. Hours	Teaching Hours
Paper I	Advanced Abstract Algebra	100	3 Hrs.	6
Paper II	Real and complex Analysis	100	3 Hrs.	6
Paper III	Differential Equations	100	3 Hrs.	6
Paper IV	Geometry	100	3 Hrs.	6
Paper V	Any one of the following: (a) Mechanics (b) Continuum Mechanics	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 –III
DIFFERENTIAL EQUATIONS**

TIME: 3 hours

Max. Marks: 100

UNIT – I

Partial differential equation: Existence and uniqueness of solutions, second order partial differential equations, boundary value problems, Green function and Cauchy problem.

UNIT – II

Calculus of variations: Linear functionals, Minimal functional theorem, General variation of a function, Euler – Lagrange’s equation, Variational methods of boundary value problems in ordinary and partial differential equations. Variation problems in parametric forms.

UNIT –III

Series solutions of a second order linear differential equations near a singular, point (for benius method). Hyper geometric functions: Definitions of hyper geometric series and function; elementary properties of hyper geometric function; Integral formula for hyper geometric series, Linear transformations, contegenous function relation, Linear relation between the solutions of hyper geometric differential equation Kumar’s confluent hyper geometric function and its simple and basic properties

UNIT –IV

Legendre's polynomial Functions: Legendre's differential equation and associated Legendre's differential equations, Simple properties of Legendre's functions of first and second kind and the associated Legendre's function of integral order.

UNIT-V

Bessel functions, Generating function, Integral formulae, Recurrence relations; Addition formula and other properties of Bessel functions. Classical Orthogonal Polynomials, Generating functions and other properties, associated with the Jacobi, Laguerre, Legendre and Hermite Polynomials.

Books recommended:

1. Rainville, E.D. : Special Functions.
2. Sneddon, I.N. : Special Functions.
3. Sneddon, I.N. : Element of Practical differential equation.
4. Forsyth, A.R. : A Treatise of Differential equations
5. Gupta, A.S. : Calculus of variations with Applications
6. Bansal, J.L. : Differential equations Vol. II
7. Gelfand, I.M. : Calculus of variations.
and Fomin, S.V.