

**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 –V (A)  
MECHANICS**

**TIME: 3 hour**

**Max. Marks: 100**

**UNIT-I**

Hydrodynamics: Lagrange's and Euler's, Methods; Acceleration, Equation of Continuity, Boundary surface, Stream lines, velocity potential. Euler's dynamical Equations, Bernoulli's Theorem, Lagrange's Equations under conservative forces, the motion once irrotational is always irrotational.

## UNIT- II

Central Orbit, Kepler's Law of Planetary motion. Rigid Dynamics: Moments and products of inertia, Principal axes theorem, Parallel axes, Momental ellipsoid, D'Alembert's principle and the equation of motion.

## UNIT-III

Motion in two dimensions under finite forces including sliding and rolling friction, Impulsive motion in two dimensions.

## UNIT-IV

Principle of momentum and energy, Lagrange's equations in generalized coordinates.

## UNIT-V

Michelson-Morley experiment, Lorentz-Fitzgerald contraction, postulates of special theory of Relativity, Lorentz transformations, Mass - Energy formula, transformation formulas for momentum and energy. Minkowski's 4-dimensional continuum space, Space like and time like intervals, Relativistic Hamiltonian and Lagrangian.

### Books Recommended:

1. S.L. Loney : Dynamics
2. A.S. Ramsay : Dynamics
3. A.S. Ramsay : A Text book of Hydrodynamics
4. M. Ray : Hydrodynamics
5. Gaur, Mathur & Goyal : Hydrodynamics
6. Bansal, Sharma & Goyal : Dynamics of a Rigid Body
7. Ray & Sharma : A Text Book of dynamics of a Rigid Body
8. M. Ray : Dynamics of a particle
9. Roy & Bali : Theory of Relativity