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-I
ADVANCED ABSTRACT ALGEBRA

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

UNIT-I

External and Internal direct product of two and finite number of subgroups; Commutator subgroup ; Cauchy's theorem for finite abelian and non abelian groups, sylow's three theorem and their easy applications, Subnormal and Composition series, Zassenhaus lemma and Jordan Holder theorem.

UNIT-II

Solvable groups and their properties, Nilpotent groups, Fundamental theorem for finite abelian groups, Annihilators of subspace and its dimension in finite dimensional vector space, Invariant, Projection, adjoins, Singular and nonsingular linear transformation, quadratic forms and Diagenalization.

UNIT –III

Prime fields of characteristic zero and of prime number, Polynomial rings, Factorization theory in Integral domain, Prime and irreducible elements, Greatest common divisor and least common multiple, Euclidean domain, Principle ideal domain and Unique Factorization domain and their related theorems, Product of ideals and nilpotent ideals.

UNIT –IV

Definition and examples of Modules, sub module, Factor (Quotient) Module, Sub module generated by a set, Sum and direct sum of two sub modules, Homomorphism and isomorphism, Three isomorphism theorems in modules, simple, and cyclic and Finitely generated module, Fundamental theorem on finitely generated modules over Euclidean rings, Noetherian and artiman modules, Hilbert basis theorem.

UNIT –V

Field extension: finite and infinite, examples, Algebraic and transcendental extensions, Splitting field Separable and inseparable extensions, Normal Extensions, Perfect fields, Finite fields, primitive elements, Automorphisms, Galois theory of field extensions and its fundamental theorem, Solution of polynomial equations by radicals, Abel's theorem.

Books recommended:

1. Surjeet Singh and   :   Modern Algebra
   Quazi Zameeruddin
2. I.N.Herstein   :   Topics in algebra
3. R.S.Agrawal   :   Algebra
4. N. Jacobson   :   Basic Algebra Vol. I, II
5. S. Lang   :   Algebra IIIrd Edition
6. P.B. Bhattacharya   :   Basic Abstract Algebra (IInd Edition)
   S.K. Jain and Etc.