

**MAJOR PAPER V – MODERN ALGEBRA**

**Unit I**

Sets, Mappings, equivalence classes – Matrices various types, inverses: product of matrices

**Unit II**

Groups, subgroups – cosets, normal subgroups – permutation groups – factor group – cyclic groups – Homomorphism and Isomorphism of groups – natural homomorphism

**Unit III**

Rings, subrings and ideals, integral domain – homomorphism and isomorphism of rings – principal ideal domains – quotient rings

**Unit IV**

Fields, subfields – characteristics of a field – polynomial rings

**Unit V**

Vector spaces, subspaces, spanning sets, linear dependence, basis, dimension of a vector space – sums and direct sums, Linear transformation of vector spaces

**Reference Books:**

1. A text book of Modern Algebra – R. Balakrishnan and N. Ramabadran
2. Algebra by S. Arumugam & Issac
3. Modern Algebra – K. Subramanian and others
4. Modern Abstract Algebra - Shanti Narayanan