

Paper V: Algebra III

I. Rings, Integral domains, fields:

Rings, types of rings, Properties of rings, rings of integer modulo n -sub rings, Ideals-Principal and maximal ideals in a commutative ring-examples and standard properties. Homomorphism and Isomorphism, properties of homomorphism. Quotient rings, Integral domains- fields- properties following the definition- field is an integral domain- finite integral domain is a field. **27 Hrs**

II. Linear Algebra:

Vector spaces, examples including \mathbb{R}^n and \mathbb{C}^n . Properties of vector spaces: subspaces. Criteria for a subset to be a subspace. Linear combination concepts of linearly independent and dependent subsets. Basis and dimension of a vector space and standard results related to a basis. Examples illustrating concept and result (with emphasis on \mathbb{R}^3). Linear transformations: Properties of linear transformations, matrix of a linear transformation, change of basis, range and kernel of a linear transformation, rank-nullity theorem. **25 Hrs**

Note: Internal Marks-25

References:

1. Hertein.I.N: Topic in Algebra (Wiley Student Edition)
 2. Fraleigh J.B: A first course in abstract Algebra (PEARSON Education)
 3. Lipschiz S: Linear Algebra (Schaum's Outline Series)
 4. Shepherd G.C: Vector spaces of finite Dimension (Oliver and Boyd)
 5. N. Jacobson: Basic Algebra Vol I & II, (Dover publications.)
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