

Paper III: Algebra- II

I. Abstract Algebra:

Groups, subgroups, cyclic groups, Lagrange's theorem and its consequences. Homomorphism and Isomorphism. Normal subgroups, quotient groups. The fundamental theorem of homomorphism. Permutation groups. Coset, decomposition of group. **15hrs**

II. Sequences:

Definition of sequence. Bounded and unbounded sequences. Convergence and divergence of sequences, monotonic sequences, algebra of convergent sequences, Cauchy's criterion for convergence. **15hrs**

III. Series of real numbers:

Partial sums of a series, convergence, divergence and oscillation of series. Properties of convergent series. Properties of series of positive terms. Geometric series. Tests for convergence of series: P-series test, comparison test, D'Alembert's ratio test, Raabe's test, De'Alembert's test for absolute convergence (without proof), alternating series, Leibnitz test. Absolute and conditional convergence. **22hrs**

Note: Internal mark: 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. G.K.Ranganath: B.Sc Mathematics (S Chand & Company Limited)
4. O.E.Stanaitis: An Introduction to Sequences, Series and Improper integrals
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