

M.A./M.Sc., (PREVIOUS) MATHEMATICS
(W.E.F. the Admitted Batch 1999-2000)

SX - 109

Paper I : Algebra (Syllabus)

UNIT I : Automorphisms of groups, conjugacy and G. sets, permutation groups, cyclic decomposition. Alternating group A_n , Simplicity of A_n , Structure theorems of groups. Direct products. Finitely generated abelian groups. Invariants of finite abelian groups. Invariants of a finite abelian group, Sylow Theorems, Groups of order p^2 , p^3 .

UNIT II : Ideals and homomorphisms of rings, sum and direct sum of ideals. Maximal and prime ideals. Nilpotent and nilideals. Zorn's lemma. Unique factorization domains. Principal ideal domains. Euclidean domains. Polynomial rings over UFD. Rings of fractions. Rings with one condition.

UNIT III : Algebraic extension of fields. Irreducible polynomials and Eisenstein criterion. Adjunction of roots. Algebraic extensions. Algebraically closed fields. Splitting fields. Normal and separable extensions. Multiple roots. Finite fields. Separable extensions.

UNIT IV : Automorphism groups and fixed fields. Fundamental theorem of Galois theory. Fundamental theorem of algebra. Roots of Unity and cyclotomic polynomials. Cyclic extensions. Polynomials solvable by radicals. Symmetric functions. Ruler and compass constructions.

Contents as in the Prescribed book : Articles 3 and 4 of Chapter 5, Chapters 7, 8, 10, 11, 12, 15, 16, 17 and 18 of the Basic Abstract Algebra by P.B. Bhattacharya, S.K. Jain and S. R. Nagpal.

Prescribed Text Book : Basic Abstract Algebra, Second Edition, by P.B. Bhattacharya, S.K. Jain and S.R. Nagpal, Published in India by Foundation Books, 2/19, Ansari Road, Daryaganj, New Delhi : 110 002.