SRI A S N M GOVERNMENT COLLEGE (A), PALAKOL

CBCS / Semester System

(W.e.f. 2015-16 Admitted Batch)

III Semester Syllabus

B.A./B.Sc. MATHEMATICS
PAPER – 3 ABSTRACT ALGEBRA

60 Hrs

UNIT - 1: (10 Hrs) GROUPS: -

Binary Operation – Algebraic structure – semi group-monoid – Group definition and elementary properties Finite and Infinite groups – examples – order of a group. Composition tables with examples.

UNIT - 2: (14 Hrs) SUBGROUPS: -

Complex Definition – Multiplication of two complexes Inverse of a complex-Subgroup definition – examples-criterion for a complex to be a subgroups.

Criterion for the product of two subgroups to be a subgroup-union and Intersection of subgroups.

Co-sets and Lagrange's Theorem :-

Cosets Definition - properties of Cosets-Index of a subgroups of a finite groups-Lagrange's Theorem.

UNIT -3: (12 Hrs) NORMAL SUBGROUPS: -

Definition of normal subgroup – proper and improper normal subgroup—Hamilton group – criterion for a subgroup to be a normal subgroup – intersection of two normal subgroups – Sub group of index 2 is a normal sub group – simple group – quotient group – criteria for the existence of a quotient group.

UNIT - 4: (10 Hrs) HOMOMORPHISM: -

Definition of homomorphism – Image of homomorphism elementary properties of homomorphism – Isomorphism – aultomorphism definitions and elementary properties–kernel of a homomorphism – fundamental theorem on Homomorphism and applications.

UNIT - 5: (14 Hrs) PERMUTATIONS AND CYCLIC GROUPS: -

Definition of permutation – permutation multiplication – Inverse of a permutation – cyclic permutations – transposition – even and odd permutations – Cayley's theorem.

Cyclic Groups :-

Definition of cyclic group - elementary properties - classification of cyclic groups.

Reference Books:

- 1. Abstract Algebra, by J.B. Fraleigh, Published by Narosa Publishing house.
- 2. A text book of Mathematics for B.A. / B.Sc. by B.V.S.S. SARMA and others, Published by S.Chand & Company, New Delhi.
- 3. Modern Algebra by M.L.

Khanna. Suggested Activities:

Seminar/ Quiz/ Assignments/ Project on Group theory and its applications in Graphics and Medical image Analysis

g. Chanderburg 31/8

(C. Sivaylov)