

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 – automorphism 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

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 – automorphism 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 :

4. Abstract Algebra, by J.B. Fraleigh, Published by Narosa Publishing house.
5. 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.
6. Modern Algebra by M.L. Khanna.

Suggested Activities:

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

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 – automorphism 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

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 – automorphism 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 :

7. Abstract Algebra, by J.B. Fraleigh, Published by Narosa Publishing house.
8. 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.
9. Modern Algebra by M.L. Khanna.

Suggested Activities:

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

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 – automorphism 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 :

10. Abstract Algebra, by J.B. Fraleigh, Published by Narosa Publishing house.
11. 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.
12. Modern Algebra by M.L. Khanna.

Suggested Activities:

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

