

ALGEBRA-IV (GROUP THEORY -II)

Total marks:100(Theory: 75, Internal Assessment: 25)

5 Periods (4 lectures +1 students' presentation),

1 Tutorial (per week per student)

(1st, 2nd& 3rd Weeks)

Automorphism, inner automorphism, automorphism groups, automorphism groups of finite and infinite cyclic groups, applications of factor groups to automorphism groups, Characteristic subgroups, Commutator subgroup and its properties.

[1]: Chapter 6, Chapter 9 (Theorem 9.4), Exercises 1-4 on page 168, Exercises 52, 58 on page Pg 188.

(4th, 5th& 6th Weeks)

Properties of external direct products, the group of units modulo n as an external direct product, internal direct products, Fundamental Theorem of finite abelian groups.

[1]: Chapter 8, Chapter 9 (Section on internal direct products), Chapter 11.

(7th, 8th& 9th Weeks)

Group actions, stabilizers and kernels, permutation representation associated with a given group action, Applications of group actions: Generalized Cayley's theorem, Index theorem.

(10th, 11th& 12th Weeks)

Groups acting on themselves by conjugation, class equation and consequences, conjugacy in S_n , p -groups, Sylow's theorems and consequences, Cauchy's theorem, Simplicity of A_n for $n \geq 5$, non-simplicity tests.

[2]: Chapter 1 (Section 1.7), Chapter 2 (Section 2.2), Chapter 4 (Section 4.1-4.3, 4.5-4.6).

[1]: Chapter 25.

REFERENCES:

1. Joseph A. Gallian, Contemporary Abstract Algebra (4th Ed.), Narosa Publishing House, 1999.
2. David S. Dummit and Richard M. Foote, Abstract Algebra (3rd Edition), John Wiley and Sons (Asia) Pvt. Ltd, Singapore, 2004