

# Discrete Mathematics Lecture Plan

S. No.	Topics to be Covered	Lectures
<b>FIRST TERM</b>		
1	Formal Logic: Proposition, Symbolic Representation	1
2	Logical Entailment Theory of Inferences and Tautologies	2
3	Predicates, Quantifiers,	1
4	Theory of Inferences for Predicate Calculus, Resolution	3
5	Techniques for Theorem Proving: Direct Proof, Proof by Contraposition, Proof by Contradiction	2
6	Principle of Mathematical Induction, Principle of Complete Induction	1
7	Overview of Sets and Set Operations	2
8	Permutation and Combination	1
9	Principle of Inclusion, Exclusion (with proof) and Pigeonhole principle (with proof)	1
10	Relation, Operation and Representation of a Relation, Equivalence Relation	2
<b>SECOND TERM</b>		
11	POSET, Hasse Diagrams, extremal Elements	2
12	Lattices	2
13	Composition of Function, Inverse, Binary and n-ary Operations	2
14	Solution Methods for Linear and Non-linear First-Order Recurrence Relations with Constant Coefficients	3
15	Graph Theory: Terminology	1
16	Isomorphic Graphs, Euler's Formula (proof)	1
17	Chromatic Number of a Graph, Five Color Theorem(with proof)	1
18	Euler & Hamiltonian Paths	1
19	Groups, Symmetry, Subgroups, Normal Subgroups, Cyclic group, Permutation Group	3
<b>THIRD TERM</b>		
20	Cayles's Theorem(without proof), Cosets Lagrange's Theorem(with proof)	2
21	Homomorphism, Isomorphism, Automorphism	1
22	Rings, Boolean Function, Boolean Expression	2
23	Representation & Minimization of Boolean Function	2

**Text Books:**

- [T1] Norman L. Biggs, "Discrete Mathematics", Oxford, second edition.
- [T2] Kenneth H. Rosen, "Discrete Mathematics and Its Applications", TMH, seventh edition.