

BSCM1211 **Discrete Mathematics**

Module- I (14 Hours)

Propositional logic, Propositional Equivalence, Predicates and Quantifiers, Nested Quantifiers, Rules of Inference, Proof methods and Strategies, Sequences and Summations, Mathematical Induction, Recursive definition and structural induction, Program Correction
Recurrence relation, Solution to recurrence relation, Generating functions, Inclusion and exclusion, Application of Inclusion and Exclusion Principle, Relation and their properties, Closure of relations, Equivalence relations, Partial orderings.

Module-II (13 hours)

Introduction to graph theory, Graph terminology, Representation of graphs, Isomorphism, Connectivity, Euler and Hamiltonian paths, Shortest path problems, Planar graph, Graph coloring, Introduction to trees, Application of trees, Tree Traversal, Minimum Spanning tree.

Module-III (13 hours)

Semi groups, Monoids, Groups, Subgroups, Cosets, Lagrange theorem, Permutation groups, Group codes, isomorphism, Homomorphisms, Normal subgroups, Rings, Integral Domain and Fields.

Algebraic systems, Lattices, Distributive and Complemented Lattices, Boolean Lattices and Boolean Algebra, Boolean Functions and Boolean Expressions.

Text Books:

1. **Kenneth H. Rosen**, "*Discrete Mathematics and its Applications*", Sixth Edition, 2008, Tata McGraw Hill Education , New Delhi.
Chapters: 1, 2(2.4), 4, 6(6.1, 6.2, 6.4-6.6), 7, 8, 9
2. **C. L. Liu and D. Mohaptra**, "*Elements of Discrete Mathematics*", Third Edition, 2008, Tata McGraw Hill Education, New Delhi
Chapters: 10 (10.1- 10.10), 11(11.1 – 11.7)

Reference Books:

1. Ralph P. Grimaldi, "Discrete and Combinatorial Mathematics", Fifth Edition, 2005, Pearson Education, New Delhi.
2. Kolman, Busby, Ross, "Discrete Mathematics", Fifth Edition, PHI Publication.
3. J.L. Gersting, "Mathematical Structure for Computer Science: A modern treatment to Discrete Mathematics' Sixth Edition, W. H. Freeman and Macmillan (India).
4. Eric Gossett, 'Discrete Mathematics with Proof, Second Edition, Wiley India Pvt Ltd
5. Thomas Koshy, "Discrete Mathematics and Applications:, Second Edition, Elsevier Publication (India), New Delhi.
6. J.L. Mott, A.Candell & I. Bekar, Discrete Mathematics for Computer Scientists and Mathematicians, PHI.