

Discrete Mathematic

Unit 1:

Sets and Relation, POSET and Lattices: Definitions, Types of sets, Operations on Sets, Inclusion and Exclusion Principle, Cartesian Product and Properties, Relation, Types of Relation, Equivalence Relation, Partial Order Relation, Function: Injective, Subjective, Bijective Mapping, Properties of partially ordered sets (Poset), Hasse diagrams, maximal and minimal elements, Join Semilattice, Meet semilattice, sub-lattices, Distributive lattices; Complemented Lattice.

Unit 2:

Mathematical Logic, Boolean Algebra and switching circuits: Propositional Logic, Logical Connector, Boolean algebras, Properties of Boolean Algebra, Conjunctive and Disjunctive Normal forms, Boole's Expansion Theorem, Boolean polynomials, Minimal forms of Boolean polynomials, Quine-McCluskey method, Karnaugh diagram, Switching Circuits and their Applications.

Unit 3:

Group Theory: Definition and Properties: Semi group, Monoid, Group, Sub-Group, Abelian Group, Finite and Infinite Group, Product and Quotient of Algebraic Structure, Lagrange's theorem, Rings, Integral Domain. Field, Applications of Group theory.

Unit 4:

Graphs: Definition, examples and basic properties of graphs. Konigsberg seven bridge problem; Subgraphs, Pseudographs, Complete graphs, Planarity Graph, Cyclic, Chromatic Number, Handshaking Theorem, Bipartite graphs, Isomorphism of graphs, Paths and circuits, Eulerian circuits, Hamiltonian cycles, Adjacency matrix, Weighted graph, Travelling salesman problem, shortest path and Dijkstra's algorithm.