Discrete Mathematical Structures

UNIT - I

Sets: Sets, Subsets, Equal Sets Universal Sets, Finite and Infinite Sets, Operation on Sets, Union, Intersection and Complements of Sets, Cartesian product, Cardinality of Set, Simple Applications. (06) Relations And Functions: Properties of Relations, Equivalence Relation, Partial Order Relation Function: Domain and Range, Onto, Into and One to One Functions, Composite and Inverse Functions, Introduction of Trigonometric, Logarithmic and Exponential Functions. (06)
Lectures: 12

UNIT - II

Partial order relations and lattices: Partial Order Sets, Representation of POSETS using Hasse diagram, Chains, Maximal and Minimal Point, Glb, lub (06), Lattices & Algebraic Systems, Principle of Duality, Basic Properties, Sub lattices, Distributed & Complemented Lattices. (06)
Lectures: 12

UNIT - III

Number Theory: Greatest Common Divisors, Euclidean Algorithms, Fibonacci Numbers, Complexity of Euclidean Algorithms, Congruences and Equivalence Relations (04) Groups & Sub groups: Group axioms, permutation groups, subgroups, cosets, normal subgroups, semi-groups, free semi-groups, monoids (04), error correcting codes (02).
Lectures: 10

UNIT - IV

Combinatorics & Recurrence Relations: Basic Theorems on permutation and combinations. Pigeon hole principle, principle of inclusion and exclusion (04). Ordinary & exponential generating functions (03) recurrence relation, solving recurrence relation by substitution, solving recurrence relation by conversion to linear recurrence relation (04).
Lectures: 11