BCA-05

Discrete Mathematics

Unit-1 : Sets
Sets – the Empty Set, Finite and Infinite Set, Equal and Equivalent set, Subsets, Power set, Universal set, Venn Diagram, Complement of a set, set operations.

Unit-2 : Relations
Cartesian products, Relation - equivalence relation - partition - partial order relation

Unit-3 : Functions
Definition, Inverse functions - Composition of functions - Properties of functions – Binary operation

Unit-4 : Mathematical Logic-1
Statements, logical connectives, truth tables

Unit-5 : Mathematical Logic-2
Tautologies, contradictions, logical equivalence, Applications to everyday reasoning

Unit-6 : Counting Principles
The Pigeonhole principle -. counting

Unit-7 : Permutation and Combination
Definition of Permutation and combination, Simple application of permutation and combination

Unit-8 : Basic Algebraic Structure
Definition and basic properties of semi groups and groups.

Unit-9 : Ring
Definition and basic properties of rings.

Unit-10 : Integral Domains and Fields
Definition and basic properties of integral domains and fields.

Unit-11 : Linear Algebra-1
Types of matrices - Matrix operations - canonical forms.

Unit-12 : Linear Algebra-2
Inverse of a matrix - Rank and nullity.

Unit-13 : Linear Algebra-3
Methods of solution to Linear systems (Cramer's Rule, Gaussian Elimination Scheme).

Suggested Readings:
        1. Elements of Discrete mathematics: C.L Lieu   Mc Graw Hill
Discrete Mathematical Structure with Application to Computer Science: Trembly J.P Mc Graw Hill