MCA – 11: Mathematics – I

Unit: 1 **[25%]**

Set Theory: -

Set, subset, equality of two sets, Null set ,Universal set, complement of a set, Difference of two sets, Venn Diagram, commutative ,associative and distributive laws , De morgans laws , Cartesian product of two sets ,power sets , Partitions sets , Mathematical Inductions , Computing Principles , Permutations , Combinations.

Unit: 2 **[25%]**

Functions:

Introduction : Definitions and Concepts, One to One, Onto functions, Invertible functions, Mathematical Functions : Floor and ceiling functions, Integer and Absolute value functions, Remainder functions, Exponential functions, logarithmic functions, Sequences and Series : Definitions, Difference between sequences and series, To find nth term and sum of n terms, Recursive functions : Definition and Examples.

Unit: 3 **[25%]**

Boolean Algebra :

Introduction, Basic Definitions, Duality, Basic Theorems, Boolean Algebra And lattice, Representation Theorem, Sum-of-product form for sets, Sum-of-products form for Boolean Algebra.

Unit: 4 **[25%]**

Vectors and Matrices:

Vectors: Definition only, Metrics: - Definition and Concept, Matrix Addition, Multiplication, Scalar multiplication, Transpose of a Matrix, Square matrices, Invertible matrices, Inverse of a matrix, Determinants, Basic theorems of determinants, Boolean Matrix.

Books:

1. Discrete Mathematics (Second Edition), S.LIPSCHUTZ, M.LIPSON (TMH)
2. Elements of Discrete Mathematics, C.L. LIU (TMH)
3. Discrete Mathematics, VINAY KUMAR (B.P.B.)
4. Discrete Mathematics, S. NANDA (Allied Publishers Pvt. Ltd.)

Question Paper Scheme:

Section – I

Q.1 Objective Type Unit I&II (11) Marks
Q.2 Unit – I OR Q.2 Unit – I (12) Marks
Q.3 Unit – II OR Q.3 Unit–II (12) Marks

Section – II

Q.4 Objective Type Unit III&IV (11) Marks
Q.5 Unit – III OR Q.2 Unit–III (12) Marks
Q.6 Unit – IV OR Q.3 Unit–IV (12) Marks