102 – Mathematics – I

Unit: 1 Set Theory: -

[18]

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: 2Function: - **[18]**

Definition, Domain and Range, Constant function, polynomial function, Relational functions, Exponential functions and Logarithm functions, Inverse function, Trigonometric functions, Graph of the functions, Recursive functions: Definitions and Examples.

Mathematical Functions :-
Floor and Ceiling functions , Integer and Absolute value functions , Remainder functions

Sequence and Series :-
Definitions, Difference between Sequence and series, To find nth term and sum of n terms

Application to Break-Even Analysis: -
Demand, supply, Revenue and cost function

Unit: 3
Vector,DeterminantsandMatrices **[18]**
Vector : Definitions only

Determinant: Concept of Determinants , Properties of determinants, Cramers Rule.

Matrices : Algebra of matrices , Row and Column Transformation, Computation of Inverse , Simultaneous equations in two And three unknown variables solve by matrix methods .

Unit : 4
Limit and Continuity **[16]**

Limit of a function, Rules of a Limit (without proof), some standard Limits (without proof)

$$\lim_{x \to a} \frac{x^n - a^n}{x - a}, \quad \lim_{x \to 0} \frac{a^x - 1}{x}, \quad \lim_{x \to 0} \frac{e^x - 1}{x}$$

$$\lim_{x \to 0} (1 + x)^{1/x}, \quad \lim_{x \to 8} (1 + 1/x)^x$$

$$\lim_{X} \frac{\sin x}{X}, \quad \lim_{X} \frac{\tan x}{X}$$

Continuity and discontinuity for a polynomial functions at a point.

Text Books :-
Advanced Mathematics – Ravi Gor (Nirav Prakashan)

Reference Book : -
Discrete Mathematics - S . Lipschutz , M .Lipson