

UNIT I**Continuity, Differentiation and Applications**

Review of limit, continuity and Differentiation, Applications: maxima and minima, making gain silo and water tank, to use minimum fencing material, to decide number of plants to get maximum yields etc., Taylor and Maclorin's Expansion of function

UNIT II**Integration and Applications**

Quick review of Integration, Length of the arc of a Cartesian and parametric co-ordinate curve, Area under the curve, Computation of Volume of solid of revolution, Computation of moment of inertia of a circle and a cylinder by means of definite integral, reduction formulae

UNIT III**Differential Equations and Applications**

Separable variable method, Linear equation method to Solve Differential equations, Applications in pest control using specific growth and decay rate equations, Method to solve higher order differential equations Applications

UNIT IV**Matrix**

Types of Matrix, row operation, row echelon form of matrix, rank and nullity, Gauss elimination, Gauss jordan method, Eigen value, Caley-Hamiltonian Theorem.

UNIT V**Functions of several variable, Partial Differentiation and Vector Calculus**

Functions of Several Variable with physical examples, Partial differentiation, Euler Theorem, error and approximation, maxima and minima.

Introduction to Vector, geometric representation, Gradient, Divergent and curl, Integral Calculus, applications of velocity and acceleration of a moving particle, Irrotational, Solenoidal, flow rate etc.

Practical

1. Practice of Continuity, differentiation
2. Application of differentiation
3. Practice and Exercise of integration
4. Application of Integration
5. Application of differential equation to field
6. Physical application of partial differentiation
7. Exercise on vector calculus

Reference Books

1. M. D. Weir *et al*: Thomas' Calculus, 11th Ed., Pearson Eduaction, 2008.
2. Stewart James: Calculus Early Transcendental, 5th Ed., Thomson India, 2007
3. Greenberg M D: Advanced Engineering Mathematics, 2nd ed., Pearson
4. Erwin Kreyszig: Advanced Engineering Mathematics, 8th Ed., Jhon Wiley & Sons, India, 1999.
5. B. S. Grewal: Higher Engineering Mathematics, Khnna Publishing House
6. N. P. Bali: Higher Engineering Mathematics, Lakshmi Publication
7. H. K. Das: Advanced Engineering Mathematics, S. Chand Publi.