Subject Code : RCCSMM11

METHODS IN NUMERICAL ANALYSIS
[In all the units the value of a root may be calculated upto 3 decimal accuracy only]

UNIT I

Algebraic & Transcendental equations– Finding a root of the given equation (Derivation of the formula not needed) using Bisection Method, Method of False Position, Newton Raphson Method, Iteration method – Types of errors.

UNIT II

Finite differences –Forward , Backward & Central differences – Their symbolic relations – Newton's forward & backward difference interpolation formulae – Interpolation with unevenly spaced intervals – Application of Lagrange's interpolating Polynomial (Proof not needed) – Divided differences and their properties – Application of Newton's General Interpolating formula. (Proof not needed).

UNIT III

Numerical differentiation - Numerical Integration using Trapezoidal rule & Simpson's first & second rules - Theory & problems.

UNIT IV

Solutions to Linear Systems – Gaussian Elimination Method – Jacobi & Gauss Siedal iterative methods – Theory & problems.

UNIT V

Numerical solution of ODE – Solution by Taylor Series Method, Picard's method, Euler's Method, Modified Euler's Method, Runge Kutta 2^{nd} and 4^{th} order methods (Derivation of the formula not needed) - Theory & problems using Adam's Predictor Corrector Method & Milne's Predictor Corrector Methods

TEXT BOOK(S)

[1] S.S.Sastry, Introductory Methods of Numerical Analysis, Prentice Hall of India Pvt.Limited, 1995.
UNIT – I -Chapter 2 section 2.1 to 2.5 of Text Book
UNIT – II -Chapter 3 Sections 3.1, 3.3, 3.6, 3.9, 3.9.1, 3.10, 3.10.1 of Text Book
UNIT – III - Chapter 4 sections 4.2 , 4.4 , 4.4.1 & 4.4.2 of Text Book
UNIT –IV - Chapter 5 Section 5.4 of Text Book
UNIT – V - Chapter 6 Sections 6.1 to 6.5 , 6.6.1 & 6.6.2 of Text Book

REFERENCE(S)

[1] S. Narayanan & Others, Numerical Analysis, S. Viswanathan Publishers, 1994.

[2] A. Singaravelu, Numerical Methods, Meenachi Agency, June 2000.