B.C.A. Part I Semester II

Paper IV

NUMERICAL METHODS

UNIT - I :

Roots of Non-Linear Equations : Algebraic equation, Polynomial equation, Transcendental equation, Iterative method, Starting & Stopping Iterative method, Bisection Method, False Position method, Newton Raphson Method: Secant Method, Determining all possible roots, Multiple roots of polynomial, Complex Roots using Muller's Method.

UNIT - II :

Solution to Linear Equations Existence of solution, Gauss Elimination Method, Gauss elimination with pivoting, Gauss Jordan Method, Round off errors and refinement, m Conditioned system, Matrix inversion method.

UNIT - III :

Linear interpolation, Lagrange Interpolation, Spline Interpolation, Interpolation with equidistant points, Least Square regression Fitting, Transcendental equations, Multiple linear regression, m conditioning in Least square

UNIT - IV :

Integration & Differentiation : Trapezoidal Rule, Simpson 1/3 Rule, Simpson 3/8 rule, Gaussian Integration, Solution to differential equation (using Runge-Kutta second and fourth order methods, Multistep method for differential equations (Milne-Simpson method, Adams-bashforth-

Reference Books:

1.S Sastry Introduction to Numerical Analysis

2.Y. Rajaraman, Computer Oriented Numerical Methods - Prentice Hall Publication

3.Gupta and Kapoor Fundamental of Mathematical Statistics

4.Brian Flowers Introduction to Numerical Methods in C++ By. (Oxford)

5.E. Balaguruswamy, Numerical Methods - Tata McGraw Hill Publication

6.Srimanta Pal Numerical Methods (Oxford)

7.K Sankara Rao Numerical Methods for Scientists & Engineers [PIlI].

8.Manish Goyal Computer Based Numerical And Statistical Techniques (Laxmi)