

PAPER - III
NUMERICAL ANALYSIS AND OPERATION
RESEARCH

The question. Paper will be divided into three sections A, B and C as follows:

Section A : In this section, questions will be set taking questions from each, unit. Each question will be short answer type not exceeding 20 words and will carry 3 /4 mark. The candidate will, be required to attempt all the questions (aggregating 7.5 Marks).

Section B : In this section, ten questions will be setting two questions from each unit. The answer of each will not exceed 250 words or two and a half page. Each question will be of 7.5 marks. The candidate will be required to attempt five questions. All, taking one question from each unit (aggregating 5 marks).

Section C : In this section, four questions will be setting all the five units and whose answers shall not exceed 500 words or five pages each. Each question will have sub-parts in it and will carry 15 marks. The candidate will be required to attempt any two questions (aggregating 30 marks).

UNIT - I

divided differences, Relation between differences and derivatives, differences of Polynomial, Newton-Gregory formula for forward and backward interpolation,

divided differences. Newton's General interpolation formula, Lagranges's interpolation formula.

UNIT - II

Gauss's central difference formula, Stirling's and Bessels interpolation formula, Inverse interpolation. Numerical differentiation, Derivatives from Interpolation formulae, Method of operators, Numerical Integration: Newton-cotes Quadrature formula, Trapezoidal, Simpson's one third, Simpson's three-eight rules.

UNIT-III

Gauss Quadrature formulae, Estimation of errors in quadrature formula, location of roots by Descarte's method of sign, Newtons theorem on multiple roots, Numerical solution of Algebraic and Transcendental equations, Bisection method, Regula-Falsi method, Method of integration .

UNIT-IV

Introduction to linear programming problems, Mathematical formulation Graphical method of solution of linear programming problems (Problems of two variables only), Theory of convex sets, Theory of Simplex method and its applications to simple linear programming problems.

UNIT - V

Concepts of duality in linear programming, formation of dual problems, Elementary theorems of duality.