

**B.C.A. Part II Semester III**  
**Paper IV**  
**OPERATIONS RESEARCH – I**

**UNIT - I :**

Introduction to Operation Research (OR) Origin and development of OR, Nature of OR, Characteristics of OR, Classification of Problems in OR, Models in OR, Phases of OR, Uses and Limitations of OR, Methodologies of OR, Applications in OR. Linear Programming – Concepts of Linear Programming Model, Mathematical Formulation of the Problem, Graphical solution methods.

**UNIT - II :**

Linear Programming Methods – Simplex Methods, Big M methods, Dual Simplex Method, TwoPhase methods. Duality in Linear Programming – Formulation of Dual Problem, Application of Duality.

**UNIT - III :**

Transportation Problem

Mathematical model for Transportation Problem, Types of Transportation Problem.

**UNIT - IV :**

Assignment Problem – Zero-One Programming Model for Assignment Problem, Types of Assignment Problem, Hungarian Method, Branch and Bound Technique for Assignment Problem.

**Reference Books:**

1. Operation Research by Kanti Swarup, P. K. Gupta, Man Mohan [Sultan]
2. Operation Research by R. Panneerselvam [PHI]
3. Introduction to Operation Research by Billy E. Gillet [TMH]
4. Operation Research by Hira Gupta
5. Operation Research Problems and Solutions by Sharma J. K. [MacMillan]
6. Operation Research Theory and Application by Sharma J. K., [MacMillan]