

## **BSc (IT)**

### **Operation research**

**(LTP::4:2:0)**

**6 Credits**

#### **UNIT-I:**

Definition of the term Operation Research – Nature, Management Application, Modeling, Principles of modeling, features, Different Phases, scope, Advantages and Limitations of O.R. General method for solving O.R models and Role of O.R in decision making. Solutions to LPP, Basic feasible solution, Optimum basic feasible solution, unbounded solution. Assumptions in LPP, Limitations of LPP, Applications of LPP and advantages of LPP.

#### **UNIT-II**

Standard Linear Programming – Formulation, Solving L.P.P. by Graphical Method. And Simplex Method. Artificial Variable Technique – two phase method and Big M method, Duality – Meaning, definitions of primal problem, General rules for converting any primal problem into its dual. Characteristics of Dual problem, Advantages of Duality, Dual formulation procedure and Problems to obtain the dual of LPP. Fundamental Duality theorems, Primal and Dual correspondence.

#### **Unit - III**

Transportation Problems – Method of finding initial basic feasible solution to Transportation problem-North West Corner, Least Cost Method and Vogel's Method. Method of finding initial basic feasible solution to Assignment Problem using Hungarian Method. Sequencing Problems – Definitions, terminology and notations, Principle assumptions, processing n-jobs through two machines. Travelling Salesman (Routing) Problems - Formulations of TSP as an assignment problem

#### **UNIT - IV**

Game Theory: Basic definitions, minmax - maxmin principle and optimal strategy solution of games with saddle point, dominance rule for solving a two-person Game, graphical method for solving two person game. Network analysis: Network and basic components, Rules for network construction, basic steps in PERT/CPM techniques and applications. Time estimates and critical path in network analysis.

#### **Text Books:**

1. S. D. Sharma – Operations research
2. Hamdy A. Taha, Operation Research – An introduction, 5th edition, PHI.,
3. Kanti Swarup, P. K. Gupta & Manmohan – Operation Research, 1996.
4. S. Kalavathy: Operations Research, Second Edition – Vikas Publications
5. J K Sharma - Operations Research