

5:2:20 (19)

**HOPT 62 : OP-2
OPERATIONS RESEARCH**

(Number of Teaching hours: 80; Time: 3 hrs; Marks: 100)

(To answer five questions, choosing one out of two questions from each unit)

UNIT I. Linear programming problem, mathematical formulation of linear programming problem, feasible solution, solution space, linear function on convex set, graphical method of solution (including exceptional cases).

UNIT II. Standard and canonical form of LPP, duality in linear programming problem; basic feasible solution, optimal solution, slack and surplus variables, initial simplex table, terminal simplex table, pivot entry, algorithm of simplex method.

UNIT III. Simplex method of solution of LPP; theory of games, two-person-zero-sum games, the maximin-minimax principle, fair and strictly determinable game, saddle point, rule for determining a saddle point.

UNIT IV. Relation between minimax and maximin game without saddle point, pure and mixed strategies, dominance property; modified dominance property, reduction of a game problem to a linear programming problem, and its solution, graphical solution of $2 \times n$ and $m \times 2$ games.

UNIT V : Markov analysis; probability vectors, stochastic and regular stochastic matrices; brand switching analysis; fixed points of square matrices; relationships between fixed points and regular stochastic matrices; Markov chains; higher transition probabilities; stationary distribution of regular Markov chains; absorbing states.

BOOKS

Text Book :

1. Swarup, K., Gupta, P. K. and Singh, M. M. : Operations Research, Sultan Chand & Sons, New Delhi, 2002 Edition.

Reference Books:

1. Gupta, P. K., and Hira, D. S. : Operations Research – An Introduction, S. Chand & Co. Ltd., New Delhi, 2002 Edition.
2. Rao, S. S. : Optimisation Theory and Applications, Wiley Eastern Ltd., New Delhi, 2001 Edition.
3. Malik, T. N. : Linear Programming, U. N. Dhar & Sons Publications, Kolkata, 2001 Edition.
