22BAB08-QUANTITATIVE TECHNIQUES FOR DECISION MAKING

L	T	P	C
2	1	0	3

PREREQUISITE:NIL

Course Objectives

- To understand, develop and solve mathematical model of linear programming problems.
- To comprehend and solve mathematical model of transportation and assignment problems.
- To provide knowledge on Game Theory and Decision theory in real time applications.
- To understand basic concepts, strategies and replacement model techniques to analyze the problems.
- To provide necessary mathematical support and confidence to tackle real time problems.

Course Outcomes The Student will be able to		**Cognitive Level**	**Weightage of COs in End Semester Examination**
CO1	Apply forecasting methods to predict future business trends and inform decision-making processes.	Ap	20%
CO2	Interpret and communicate quantitative findings effectively to stakeholders	Ap	30%
CO3	Analyze production management techniques to optimize production schedules and operations	An	30%
CO4	Assess risks and uncertainties in business decisions using quantitative methods, enhancing their risk management skills.	E	10%
CO5	Solve linear programming problems using graphical and simplex methods, gaining proficiency in identifying optimal solutions for business optimization.	C	10%

UNIT I-LINEAR PROGRAMMING PROBLEMS (6+3)

Introduction to applications of operations Research in functional areas of management Linear Programming-Formulation, Solution by Graphical and Simplex Methods.

UNIT II-TRANSPORTATION AND ASSIGNMENT PROBLEMS (6+3)

Transportation Models (Minimizing and Maximizing Cases) - Balanced and unbalanced cases - Initial basic feasible solution by N-W Corner Rule, Least cost and Vogel's approximation method. Check for Optimality. Solution by MODI/ Stepping stone method. Assignment Models (Minimizing and Maximizing problems) - Balanced and unbalanced problems. Solution by Hungarian method. Travelling Salesman problems.

UNIT III-DECISION AND GAME THEORIES (6+3)

Decision making under risk, Expected Monetary value approach, Decision trees - Decision making under uncertainty. Game Theory- Two person zero sum games- Saddle point, Dominance Rule, graphical Method for 2 x n or m x 2 Games.

UNIT IV-INVENTORY AND REPLACEMENT MODELS (6+3)

Inventory Models - EOQ and EBQ Models (With and without shortages), Quantity Discount Models(one price break and two price breaks only) Replacement models - Individuals replacement models (With and without time value of money) - Group Replacement Models.

UNIT V-QUEUINGTHEORYANDSIMULATION (6+3)

Queuing Theory - single and Multi-channel models - infinite number of customers and infinite calling source. Monte-Carlo simulation- use of random Numbers.

TOTAL(L:30+T:15):45PERIODS

REFERENCES:

1. Vohra N.D., "Quantitative Techniques in Management", 5th Edition, McGraw Hill Education, New Delhi, 2017.
2. G. Srinivasan, "Operations Research - Principles and Applications", 2nd Edition, PHI, 2011.
3. Paneer Selvam R., "Operations Research", 2nd Edition, PHI Learning, New Delhi, 2014.
4. Hamdy A Taha, "Introduction to Operations Research", Prentice Hall India, 10th Edition, Third Indian Reprint 2019.
5. Gupta M.P., "Quantitative Techniques for Decision Making", 4th Edition, PHI Learning, New Delhi, 2013.
6. Sharma J.K., "Operations Research - Theory and Application", 6th Edition, Laxmi Publications, New Delhi, 2017.

Mapping of Course Outcomes (COs)with Programme Outcomes (POs)

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	3				
CO2		2	3	2	2
CO3		3		3	3
CO4		3	2	2	
CO5	3				2
CO(W.A)	3	2.7	2.5	2.3	2.3