BA5201 APPLIED OPERATIONS RESEARCH

DETAILED SYLLABUS

OBJECTIVE:

- To learn the concepts of operations research applied in business decision making.

UNIT I INTRODUCTION TO LINEAR PROGRAMMING (LP)

Introduction to applications of operations research in functional areas of management. Linear Programming-formulation, solution by graphical and simplex methods (Primal - Penalty, Two Phase), Special cases. Dual simplex method. Principles of Duality. Sensitivity Analysis.

UNIT II LINEAR PROGRAMMING EXTENSIONS

Transportation Models (Minimising and Maximising Problems) – Balanced and unbalanced Problems – Initial Basic feasible solution by N-W Corner Rule, Least cost and Vogel's approximation methods. Check for optimality. Solution by MODI / Stepping Stone method. Case of Degeneracy. Transhipment Models. Assignment Models (Minimising and Maximising Problems) – Balanced and Unbalanced Problems. Solution by Hungarian and Branch and Bound Algorithms. Travelling Salesman problem. Crew Assignment Models.

UNIT III INTEGER PROGRAMMING AND GAME THEORY

Solution to pure and mixed integer programming problem by Branch and Bound and cutting plane algorithms. Game Theory-Two-person Zero sum games-Saddle point, Dominance Rule, Convex Linear Combination (Averages), methods of matrices, graphical and LP solutions.

UNIT IV INVENTORY MODELS, SIMULATION AND DECISION THEORY

Inventory Models – EOQ and EBQ Models (With and without shortages), Quantity Discount Models. Decision making under risk – Decision trees – Decision making under uncertainty. Monte-carlo simulation.

UNIT V QUEUING THEORY AND REPLACEMENT MODELS

Queuing Theory - single and Multi-channel models – infinite number of customers and infinite calling source. Replacement Models-Individuals replacement Models (With and without time value of money) – Group Replacement Models.

REFERENCES:

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2. N. D Vohra, Quantitative Techniques in Management, Tata Mcgraw Hill, 2010.

3. Hamdy A Taha, Introduction to Operations Research, Prentice Hall India, Ninth Edition, 2010.

4. Anderson, Sweeney Williams Solutions Manual to Accompany AnIntroduction to Management

Science Quantitative Approaches to Decision, Cengage, 12th edition, 2012

5. G. Srinivasan, Operations Research – Principles and Applications, II edition, PHI, 2010.

6. Bernard W. Taylor, Introduction to Management Science, 12th edition, 2012