

To be effective from the Year 2016-17

New Syllabus of Gujarat University for M.Com. Semester 4

COM 507 – OPERATIONAL RESEARCH

Unit:1 Introduction to Operations Research: (25%)

Definitions of O.R., Nature and Scope of O.R., Phases of O.R., Different types of Models in O.R., Iconic or Physical models, Analogue or Schematic models, Symbolic models, Deterministic models, Probabilistic models, General models, Dynamic models, Heuristic models, Types of Mathematical models, Advantages of Models, Decision theory, Decision making under certainty, Risk and Uncertainty conditions- Introduction, Applications of O.R. in the fields of Marketing, Finance, Planning, Research Development Techniques, Limitations of O.R., O.R. in India.

Unit:2 Linear Programming and its Applications: (25%)

Definitions of Linear Programming, Linear Programming as an Optimization Technique, Structure of an L.P. problem, Formulations of L.P. problem, Graphical Method, Simplex method for Maximization problem, Big-M method for Minimization case, Degeneracy, Unbounded, Infeasible and Alternative Solution cases, Advantages and Limitations of Linear Programming, Applications Of L.P.: Production planning problem, Advertising Media Selection problem, Oil Refinery Blending problem, Product Mix problem. Transportation Problem and Assignment Problem: Transportation Model, Formulation of Transportation Problem as an L.P. model, Vogel's approximation Method, Modified Distribution Method, Optimality Tests, Degeneracy in T.P., Unbalanced T.P., Assignment Problem: Formulation, Hungarian Method, Constrained Assignment Problem.

Unit:3 Theory of Games and Sequencing Problems: (25%)

Study of Two Person Zero-sum Game Problems, Games with and without Saddle point, Principles of Dominance, Graphical method, Conversion of Game problem into an L.P. problem, Problem of Sequencing: Sequencing of n jobs on two and three machines, Applications of Game theory and Sequencing problems.

Unit:4 Network Analysis: (CPM & PERT): (25%)

Concept of Network, Network Diagram, Concepts connected with a Network, Labeling Method, Critical Path Method, Determination of Floats: Total Float, Free Float and Independent Float and examples related to them. Project Evaluation and Review Technique (PERT), Applications of CPM and PERT, Determination of project time and project variance and examples related to them using the principle of Normal distribution.

References:

1. Sharma J.K.: Introduction to Operations Research
2. Taha H. A.: Operations Research- An Introduction
3. Hiller and Lieberman: Operations Research
4. Vohra N.D.: Quantitative Techniques for Management
5. Rao S.S : Optimization Theory and Applications
6. Kapoor V.K.: Problems and Solutions in Operations Research