H. N. G. University , Patan
M.C.A(5 Years Integrated Programme) – Semester - V
502: Computer Based Optimization Models

Unit: 1 **[25%]**

Linear Programming Problems (LPP): Formulation of an LPP, Solution of an LPP using Graphic Method and Simplex Method, Slack, Surplus and Artificial Variables, Two-Phase and Big-M Method, Special cases in LPP: Alternate Optimum solution, An Unbounded Solution, Infeasible Solution, Duality in LPP, Integer Simplex Programming.

Unit: 2 **[25%]**

Transportation Problems: Definition, Methods for finding initial basic feasible solutions- North West Corner Rule, Least Cost Cell Entry Method, Vogel's Approximation Method, Methods for finding Optimal Solution – MODI Method,

Assignment Problems: Definition and concept, Solution of an Assignment Problem for optimum solution – Hungarian Method.

Sequencing: Job-Sequencing Problems for … Processing N jobs on 2 Machines, Processing N jobs on 3 Machines, Processing N jobs on M Machines, Processing 2 jobs on M Machines (Graphic Method)

Unit: 3 **[25%]**

Inventory Models: What is Inventory?, Types of Inventories, Inventory Decisions, Costs involved in Inventory Problems, Controlled and Uncontrolled Variables, Deterministic Inventory Models (Only Static Demand Models), Selective Approaches to Different Inventory control Systems, Concept of an average Inventories, Concept of Economic Order Quantity (EOQ), (In short Model – I, II and Model III)

Replacement Models: Introduction - The Replacement Problem, Replacement of items that deteriorate (With Money Value), Replacement of Items that fail completely (Mortality Theorem)

Unit: 4 **[25%]**

Project Management By PERT and CPM: Introduction, Historical Development of CPM/PERT, Applications of PERT – CPM Techniques, Net – Work Diagram Representation, Rules for Drawing Network, Time estimation and Critical Path in Net-Work Analysis. Queuing theory: Introduction, queuing system, Queuing Problem, Transient and Steady states, traffic Intensity, distribution of queuing systems (Birth and Death Process), Queuing Models – I, II and III

Text Books :-

1. Operation Research By J. K. Sharma

Reference Book : -

1. Operation Research By R. Pannerselvam
2. Operation Research By S. D. Sharma