Paper-II (MCA-502) : Modeling and Simulation

UNIT - I

System definition and components, stochastic activities, continuous and discrete. System modeling, types of models, static and dynamic physical models, static and dynamic mathematical models, full corporate model, types of system studies.

UNIT - II

System simulation, why to simulate and when to simulate? Basic nature of simulation, techniques of simulation, comparison of simulation and analytical methods, types of system simulation, real time simulation, hybrid simulation, Monte Carlo method and its applications, distributed Lag models, cobweb model.

UNIT - III

Simulation of continuous systems, analog v/s digital simulation, single server queuing system and an inventory problem. discrete system simulation, Fixed time-step vs. even-to-event model, random number generators - Linear congruential generator, mid square Method, multiplicative congruential generator, rejection Method, testing of random Numbers .

UNIT - IV

System dynamics, exponential growth models, exponential decay model, modified exponential growth model, logistic model, generalization of growth models, system dynamics diagrams. simulation of queuing systems : queuing disciplines, notation, simulation of single and two server, performance measure of single server. simulation of PERT networks, network model of a project, analysis of activity network, critical path computation – labeling and time estimate method, uncertainties in activity duration, simulation of activity network.

UNIT - V

Introduction to GPSS : Creating and moving transactions, conditional transfers, program control statements, queues, facilities and storages, gathering statistics, priorities and parameters, standard numerical attributes, functions, solutions of problems based on GPSS.

Recommended books : System simulation - Gorden G

System simulation with digital computer - Narsing Deo