

PAPER XXIV - SYSTEM MODELING AND SIMULATION.

UNIT – I

Principle of Computer Modeling and Simulation – Monte Carlo Simulation – Nature of Computer Modeling and Simulation – Limitation of Simulation – Areas of Application – System and Environment – Components of a system – Discrete and Continuous Systems – Models of a system – A variety of Modeling Approaches.

UNIT – II

Random Number Generation, Technique for Generating Random Numbers – Mid square Method – The Mid Product Method – Constant Multiplier Technique – Additive Congruential Method – Linear Congruential Method – Tauswarthe Method – Tests for Random Numbers – The Kolmogorov Smirnov test – The Chi – square test.

Random Variable Generation – Inverse Transform Technique – Exponential Distribution – Uniform distribution – Weibull distribution – Empirical Continuous Distribution – Generation approximate Normal Varieties – Erlang Distribution.

UNIT – III

Empirical Discrete Distribution – Discrete Uniform Distribution – Poisson Distribution – Geometric Distribution – Acceptance – Rejection Technique for Poisson Distribution – Gamma Distribution.

UNIT – IV

Design and evaluation of simulation experiments – Input – Output Analysis – Variance reduction technique – Antithetic Variables – Verification and Validation of Simulation models.

Discrete Event Simulation – Concepts in Discrete – event Simulation, Manual Simulation using event Scheduling, Single Channel Queue, two server queue, Simulation of Inventory Problem.

UNIT – V

Simulation Languages – GPSS – SIMSCRIPT – SIMUKA – SIMPLE 1, Programming for Discrete event systems in GPSS, SIMPLE 1 and C – Case Study.

Simulation of LAN – Manufacturing System – Hospital System.

Text Books:

1. Jerry Banks and John S. Carson, "Discrete Event System Simulation", Prentice Hall of Inc. 1984.
2. Narsingh Deo, "System Simulation with Digital Computer", Prentice Hall of India, 1979.

Reference Books:

1. Frances Neelam kovil, "Computer Simulation and Modeling", John Wiley & Sons, 1987.
2. Roth M. Davis and Robert M. O. Keefe, "Simulation Modeling with Pascal", Prentice Hall of Inc. 1989.