

(3 Hours)

[Total Marks : 100]

B.E. Sem-7 (Rev.)  
Comp & I.T.

Computer Simulation &amp; Modeling

N.B.: (1) Question No. 1 is compulsory.

22/12/08

(2) Solve any **four** questions out of remaining **six** questions.

1. (a) Elaborate the steps in simulation study. Why is it necessary to have program and process documentation. 10  
 (b) Give the input parameters, simulation variable, output statistics for the queueing system. Calculate the output statistics for the queueing system whose interarrival and service times for ten arrivals are given below : 10

Interarrival time :	8	6	1	8	3	8	7	2	3
Service time :	4	1	4	3	2	4	5	4	5
2. (a) Write event scheduling algorithm. Give system snapshots. 10  
 (b) What are the different categories of simulation software ? Mention the features of GPSS simulation software. 10
3. (a) Describe the inventory system when :- 10
  - (i) Lead time is zero
  - (ii) Lead time is independent of demand
  - (iii) Lead time is dependent on demand.
 (b) State the properties of random numbers. How are random numbers generated ? 10
4. (a) Give the equation for steady state parameters of M/G/1 queue and derive M/M/1 from M/G/1. 10  
 (b) Describe a Poisson process and relate it to arrival event, queue behaviour and discipline. 10
5. (a) Mention the steps in input Modeling. How would you collect input data ? 10  
 (b) By using Invert Transform Technique which of the distributions random variates can be generated. Develop a random-variate generator for random variable X with the p.d.f. 10

$$f(x) = \begin{cases} e^{2x}, & -\infty < x \leq 0 \\ e^{-2x}, & 0 < x < \infty \end{cases}$$
6. (a) What do you understand by model verification and validation ? How would you validate input-output transformation of a model ? 10  
 (b) How can be initialization bias be reduced in steady state simulation ? 10
7. Write short notes on any **two** :- 20
  - (a) Acceptance - Rejection Technique
  - (b) Trends in Simulation Software
  - (c) Issues in the Simulation of Manufacturing Systems
  - (d) Output Analysis for Steady State Simulation.