

--	--	--	--	--	--	--	--	--	--

Eighth Semester B.E. Degree Examination, June/July 2017
System Modeling and Simulation

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting
atleast TWO questions from each part.**

PART – A

- 1 a. What is simulation? List and explain the steps in simulation study. (10 Marks)
- b. Define the following :
(i) System (ii) Entity (iii) Activity (iv) Endogenous event (v) Exogenous event
(vi) State. Identify them for any one system. (10 Marks)
- 2 a. Explain event scheduling / time advance algorithm using this algorithm generate the system snapshot for the following.
Consider a single server queuing system with interarrival and service time details as shown below:

IAT	3	2	6	2	4	5
ST	2	5	5	8	4	5

Stop simulation when simulation clock reaches 20. (14 Marks)
- b. Write short notes on :
(i) List processing (ii) Simulation in GPSS. (06 Marks)
- 3 a. Explain the following discrete distributions:
(i) Binomial distribution (ii) Poisson distribution (08 Marks)
- b. Explain the following continuous distributions:
(i) Uniform distribution (ii) Exponential distribution
(iii) Triangular distribution (iv) Normal distribution (12 Marks)
- 4 a. List and explain characteristics of queuing system. Briefly explain queuing notations. (14 Marks)
- b. Explain the steady-state behavior of $M | G | 1$ queue. (06 Marks)

PART – B

- 5 a. What are pseudo random numbers? What are the problems that occur while generating pseudo random numbers? Also list the important considerations during generation of random numbers. (10 Marks)
- b. Briefly explain different techniques for generating random number. (05 Marks)
- c. Consider the following sequence of five numbers: 0.44, 0.81, 0.14, 0.05, 0.93 are generated. Use the Kolmogorov-Smirnov test with $\alpha = 0.05$ to test the uniformity property of random number generated. (05 Marks)
- 6 a. Mention the different steps in the development of a useful model of input data. (04 Marks)
- b. List and briefly explain the different ways to obtain information about process even if data are not available. (06 Marks)
- c. Explain in detail goodness-of-fit tests in details. (10 Marks)

- 7 a. Discuss output analysis for steady state simulation in detail. (10 Marks)
b. Discuss output analysis for terminating simulation in detail. (10 Marks)
- 8 a. With a neat diagram, explain the concept of model building, verification and validation. (10 Marks)
b. Describe the three step approach formulated by Naylor and Finger in the validation process. (10 Marks)

* * * * *

CMRIT Library