

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

Eighth Semester B.E. Degree Examination, Feb./Mar. 2022
System Modeling and Simulation

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting at least TWO full questions from each part.

PART – A

- 1 a. List out atleast 5 circumstances, when simulation is appropriate tool and when it is not appropriate. (05 Marks)
- b. With a flow chart, explain the steps in simulation study. (12 Marks)
- c. Compare discrete and continuous system. (03 Marks)
- 2 a. Explain the concepts in discrete event simulation. (07 Marks)
- b. Write an Algorithm for event scheduling. (05 Marks)
- c. How world views are helpful in developing models? (04 Marks)
- d. Explain list processing. (04 Marks)
- 3 a. Discuss the following concepts:
 - i) Discuss Random variables
 - ii) Continuous Random variables
 - iii) Cumulative distribution function
 - iv) Expectation. (08 Marks)
- b. Explain the following statistical models:
 - i) Inventory and supply chain systems. (06 Marks)
 - ii) Reliability and maintainability. (06 Marks)
- c. Explain the following distributions: i) Uniform ii) Exponential. (06 Marks)
- 4 a. What are the key elements of the Queuing system? Explain the characteristics of Queuing systems. (07 Marks)
- b. List out the primary performance measures of Queuing systems with their meaning. (08 Marks)
- c. What is M/G/1 queues? List out the steady state parameters of M/G/1 queue. (05 Marks)

PART – B

- 5 a. Explain different techniques used for generating Random numbers. (06 Marks)
- b. The sequence of number 0.44, 0.81, 0.14, 0.05, 0.93 has been generated. Use the Kolmogorov Smirnovtest with $\alpha = 0.05$ to determine if the hyperthesis that the numbers are uniformly distributed at the interval $[0, 1]$ can be rejected. (08 Marks)
- c. Explain different tests for random numbers. (06 Marks)
- 6 a. List and explain the suggestions that may enhance and facilitate data collection. (07 Marks)
- b. Explain Goodness-of-fit test by considering chi-square test. (07 Marks)
- c. Explain multivariate and time series input models. (06 Marks)
- 7 a. Compare Terminating v/s non-terminating simulations. (04 Marks)
- b. Explain confidence-Interval estimation. (06 Marks)
- c. Explain about analysis for terminating simulations and output analysis for steady-state simulations. (10 Marks)
- 8 a. With a neat diagram, explain verification of simulation model. (07 Marks)
- b. Write a short notes on optimization v/s simulation. (03 Marks)
- c. Describe with a neat diagram Iterative process of calibration model. Which are the 3 steps that aid in the validation process? (10 Marks)

* * * * *

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.