

**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 Smirnov test with  $\alpha = 0.05$  to determine if the hypothesis 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.