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.
　　　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)**

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