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Roll No

MCSE-302(D)
M.E./M.Tech., III Semester
Examination, December 2020
Simulation and Modeling
(Elective-II)
Time : Three Hours

Maximum Marks : 70

- Note:** i) Attempt any five questions.
ii) All questions carry equal marks.

1. a) Explain modeling and simulation methodology.
b) Generate 10 random numbers by using the following function:
$$Y = 0.5093 + 0.2 \sin(X) \quad 0 \leq X \leq \pi/2$$
2. a) Write the basic concept of continuous and discrete random variable and their distributions.
b) Explain queuing theory and characteristics of queuing system.
3. a) What is a random variable? Consider a random variable X which takes on value 1 and 2 with probability 0.25 and 0.75, respectively (i.e., $\Pr[x = 1] = 0.25$ and $\Pr[x = 2] = 0.75$). Determine the mean variance of X. Plot the Probability Density function and Probability Distribution function of X.
b) How can we compute the steady state solution of the M/M/I queue?

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4. a) How DYNAMO simplifies the equation? Explain and describe with example.
b) What is System Dynamic Modeling? Explain causal loop diagrams and flow diagrams with example.
5. a) In the context of modeling and simulation define verification, validation and credibility.
b) Describe simulation languages comparison and selection.
6. a) Explain Birth-death system.
b) Write a short note on POWERSIM and Validation of experimental models.
7. a) Which are the major industries where simulation is used? Name any two simulation software and explain it?
b) Write a short note on simulation aspect of Poisson's formula.
8. a) Differentiate between continuous and discrete system.
b) Discuss the Acceptance-Rejection method for the generation of pseudo-random numbers.

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