Roll No .....

MEDC - 202

M.E./M.Tech., II Semester

Examination, July 2015

Modeling And Simulation Of Computer

Time : Three Hours

Maximum Marks : 70

Note : i) Attempt any five questions.

ii) All questions carry equal marks.

1. a) What are the features to be considered while building a simulation model? Explain the basic steps needed to make a simulation study. 7
   b) Discuss any three tools that are used for reducing the variance of simulation experiments. 7

2. a) Discuss the Acceptance-Rejection method for the generation of pseudo-random numbers. 7
   b) With the help of a flow diagram explain the simulation of a style channel queuing system. 7

3. a) Explain chi-square goodness of fit test. Apply it to Poisson assumption with $\alpha = 3.64$. Data size = 100 and observed frequency O_i = 12, 10, 19, 17, 10, 8, 7, 5, 5, 3, 3, 1. 7
   b) Describe the coefficient of variation, generation of arrivals pattern and various measures of queue. 7

4. a) Differentiate between: 7
      i) Continuous and discrete systems
      ii) Continuous distribution and empirical distribution
   b) What is inverse transform technique? Derive an expression for exponential distribution. 7

5. a) What is the role of maximum density and maximum period in generation of random numbers? With given seed 45, constant multiplier 21, increment 49 and modulus 40, generate a sequence of five random numbers. 7
   b) What do you mean by verification and validation of simulation model? Explain calibration and validation of models with the help of diagram. 7

6. a) Discuss types of simulation with respect of output analysis with examples. 7
   b) Consider the grocery store with one checkout counter prepare the simulation table for eight customers and find out average waiting time of customer in queue idle time of server, and average service time. The Inter Arrival Time (IAT) and Service Time (ST) are given in minutes.
      IAT: 3, 2, 6, 4, 4, 5, 8
      ST (min): 3, 5, 5, 8, 4, 6, 2, 3
      Assume first customer arrives at t = 0 7

7. a) Explain the distinction between terminating or transient simulation and steady state simulation. Give examples. 7
   b) Using suitable frequency test find out whether the random numbers generated are uniformly distributed on the interval [0, 1] can be rejected. Assume $\alpha = 0.05$ and $D_o = 0.565$. The random numbers are 0.54, 0.73, 0.98, 0.11, 0.68. 7

8. Write short notes on: 14
   a) Data collection
   b) Random variate distribution
   c) Normal distribution

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