Total No. of Questions :8] *[Total No. of Printed Pages :2*

 Roll No .....

MCSE-302(B)

M.E./M.Tech., III Semester

Examination, June 2017

Simulation and Modeling

(Elective-II)

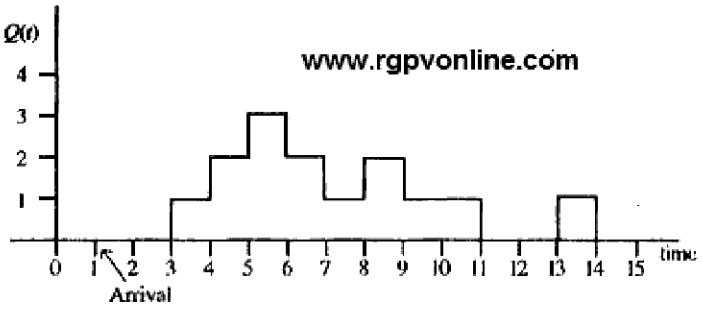
Time : Three Hours

Maximum Marks : 70

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

1. a) Explain modeling and simulation methodology.
   b) Write the basic concept of continuous and discrete random variable and their distributions.

2. a) Explain queuing theory and characteristics of queuing system.
   b)



In the above single-server queuing system, find
i) $\hat{d}$(n) average delay in queue.
ii) Average number of customers in the queue, $\hat{q}$(n) and
iii) Efficiency of utilization of the server, $\hat{u}$(t).(n=6 number of customers to finish program.)

3. a) What is a random variable? Consider a random variable X which takes on values 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 and variance of X. Plot the probability density function (pdf) and Probability Distribution Function (PDF) of X.
   b) What are the applications of queuing theory in computer system?

4. a) Discuss the concept of probability and random variable.
   b) Write short note on simulation aspect of poisson's formula.

5. a) Explain Birth-death system.
   b) Define the following :
      i) Validation of experimental models,
      ii) Testing and analysis.

6. a) How to formulate the model for a dynamic system?
   b) Write the advantages and disadvantages of simulation.

7. a) In the context of modeling and simulation define Verification, Validation and Credibility.
   b) Can a simulation model be verified but not valid and vice-versa? Investigate your answer with an example for each.

8. a) Describe simulation languages comparison and selection.
   b) Which are the major industries where simulation is used? Name any two simulation software and explain it.

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