NR/R09

Code No: B3305 / D3301

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.Tech II Semester Examinations, October 2011
SIMULATION MODELLING OF MANUFACTURING SYSTEMS
(ADVANCED MANUFACTURING SYSTEMS)

Time: 3hours **Max.Marks:60**

Answer any five questions
All questions carry equal marks

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1.a) Explain various ways of analyzing the system with appropriate flow chart.
b) Assume that you need to estimate the average time required to encash a cheque in a typical bank through a simulation model. Explain various steps you would follow in this regard. [12]

2.a) Define the following terms:
i) Consistency
ii) Unbiased ness and
iii) Efficiency
b) A machinist is expected to make engine parts with axle diameter of 1.75 cm. A random sample of 10 parts shows a mean diameter of 1.85cm, with an SD of .01 cm . On the basis of this sample, would you say that the work of the machinist is inferior? Assume suitable level of significance. [12]

3.a) Explain the terms i) Verification, ii) Validation and iii) Credibility
b) Explain various principles involved in the development of valid simulation model. [12]

4.a) Explain various techniques for verification of simulation model with suitable examples.
b) Explain the three step approach for developing valid and credible simulation model. [12]

5.a) "Selection of right distribution for random elements is essential for better simulation results"- Explain.
b) List out various approaches for modeling random elements and explain any two and compare them. [12]

6.a) List out various algorithms for generating random variates from given distribution and explain any two in detail.
b) Generate 10 random variates from the following distributions
i) U (30, 90) ii) Weibul (2, 20) and iii) Binomial (4, 0.6) [12]

7.a) Draw the symbols used in GPSS
b) A toll gate in a highway consists of 5 lanes. The inter-arrival time of the vehicles at the toll gate follow uniform distribution with 120±20 seconds. The service time also follows uniform distribution with 30 ±10 seconds. Draw a GPSS diagram and prepare a program to simulate the system for 5 hrs. [12]

8.a) Explain the Replication method for the simulation output data analysis
b) Simulate the M/M/1 queue with run length of four customer arrivals. Take mean arrival rate as 40/hr and mean service rate as 60/hr. Estimate average waiting time with simulation output data to 95% confidence interval limits. [12]

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