

B.E. / B.Tech. (Full Time) DEGREE END SEMESTER EXAMINATIONS, NOV/DEC 2011
MANUFACTURING ENGINEERING BRANCH
SEVENTH SEMESTER
MF9024 COMPUTER SIMULATION
(REGULATIONS 2004)

Durations: 3hr

Max Mark: 100

Answer ALL QuestionsPart – A (10 X 2 = 20Marks)

1. When is simulation an appropriate tool of analysis?
2. Define state of a system.
3. Mention some applications of random numbers.
4. What is the need for testing random numbers/
5. What are the disadvantages of linear congruential method of generating random numbers?
6. Give an example for steady state condition.
7. When is replication of simulation required?
8. What is the need for simulation languages?
9. In what way Arena is different from Simscript?
10. What is renegeing?

Part – B (5 X 16 = 80Marks)

11. In an electric board people arrive for paying their electric bills at the rate of 6 ± 2 minutes among which 35% are women. There are two clerks who function at the rate of 7 ± 2 minutes and 8 ± 3 minutes respectively. 10% of the customers before leaving meet the assistant engineer for getting some clarifications after paying their bills while others simply exit. Make eardeaf analysis and explain the flows with a simple flow model. (16)

12. a. Explain the advantages, disadvantages and applications of simulation. (16)

(OR)

b. Describe various type of simulation models with suitable examples and diagrams. (16)

13.a. A sample of 100 arrivals of cars at a service-center is according to the following distribution.

Time between arrivals (min)	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
Frequency	2	6	10	23	20	14	7	6	4	4	2	2

A study of the time required to service cars by adding up the bills, receiving payments and servicing yields the following distribution.

Time between service (min)	0.5	1.0	1.5	2.0	2.5
Frequency	10	25	38	18	9

Estimate the average percentage car waiting time and average percentage idle time of the server by simulation for the next 10 arrivals. (16)

(Or)

b. Explain the procedure of generating random numbers based on:

i. Mid square method (8)

ii. Normal distribution method. (8)

Assume suitable values.

14.a. A leather industry operating with two divisions A and B manufactures leather bags. Raw materials are received in a single unit (consisting of 100 items) that is dispatched to division A at the rate of 50 ± 5 items, while the remaining items go to division B. The process times of each division follows 150 ± 50 minutes. Assuming that the raw materials are instantaneously replenished, find out how many bags are produced on the whole in 1000 time units. Each division releases $(X \cdot 5) \pm 10$ bags at the end of each processing. Simulate manually and find out the total number of bags produced at the end of simulation. Note: X is the number of items received by a division at a time. (16)

(Or)

b. Tourists arrive in buses at the rate of 30 ± 5 minutes. They have three locations viz a monument, a museum and a poorly maintained park to visit. Tourists first visit the monument to spend 15 ± 5 minutes and then they go to the museum where they spend 12 ± 8 minutes. Only 50% of the sets visit the less maintained park to spend 8 ± 2 minutes. If one set refers to a constant of 50 tourists from each bus, find out how many tourists complete visiting the spots in 6 hours time. Assuming that a set always move together, find out the ideal time of the park. Also find out the total number of tourists in the station at the end of simulation time. (16)

15.a. Give an exclusive summary of various features and advantages of SIMULA (16)

(Or)

b. Elaborate on the features, pros and cons of ARENA. (16)