Assignment -1

Q.1 Name Three of the principal entities, attributes, event, state variable and activities to be considered of the operation of following is to be carried out.

1) Computer Centre   2) Bank

3) Reservation counter   4) Hospital OPD

5) A Traffic Crossing   6) Post office

7) Automobile assembly line   8) A bus stand

Q. 2 Difference between endogenous and exogenous system.

Q. 3 "the complete aircraft system might even be regarded as a discrete system ". Proof this statement.

Q. 4 What are the stochastic activates? Explain with the help of example.

Q.5 Difference between continuous and discrete system with suitable example.

Q.6   Discuss the various advantages of simulation.

Q.7 Give five example of each of following:

1) Continuous System   2) Discrete system

3) Stochastic system   4) Mathamatical model

Q.8 Make an irregular figure of known area, then determine its area by Monte Carlo Method. Use the random number to generate the points. Compare the accuracy of your result when the total number of points is:

1) 50   2) 100   3) 200

Q. 9 Determine the value of Pi (Π) by employing the monte carlo method, and using the relation, Area of the circle $=\Pi D_2/4$. Determine the value for 20, 40 and 100 pairs of random numbers.

Q. 10 A drunked moves from a point to a destination and takes steps in the forward direction, to his left and to his right, at random. The length of step is almost constant. The probability of taking a step in the forward direction is 50% while the probability of taking the right is 20%. if the co-ordinate of the starting points are taken as (0,0) and teh forward is due Y-direction, find the position of drunked after he takes 50 steps.

Q. 11 A machine centre has three identical bearing, which fall according to the following probability distribution.

Bearing Life (hours)	Probablity
1000	0.10
1100	0.14
1200	0.24
1300	0.14
1400	0.12
1500	0.10
1600	0.06
1700	0.05
1800	0.03

the present maintenance policy is to change a bearing as and when it fails. When a bearing fails machine center stops, a repauirman is called to replace the failed bearing with new one. The time between the failure of the bearing and reporting of the repairman (delay time) is random and is distributed under.

Delay Time (Min)	Probablity
4	0.3
6	0.6
8	0.1

It takes 20 minutes to change one bearing, 30 minutes to change two bearing and 40 minutes to change all the three bearing. Downtime of the machining centre cost Rs. 5 per minute, direct on job cost of repairman is Rs. 25 per hour and the cost of bearing is Rs. 20. The maintenance department is interested in evaluating an alternative policy of replacing all the three bearing, whenever bearing fails.

Q.12 In the reliability problem of question 11, the bearing life distribution as follows

Hours	Probablity
1200	0.10
1400	0.25
1600	0.30
1800	0.25
2000	0.10

the remaining data is same. Simulate the system for present and proposed policies of maintenance and find the best policy.

Q.13 Discuss Important steps in simulation and model building.

Q.14 A piece of equipment contains four identical tubes and can function only if all the four tubes are in working order. The lives of tubes has approximately uniform distribution from 1000 to 2000 hours. The current maintenance practice is to replace a tube when it fails. Equipment has to be shut down for 1 hour for replacing a tube, the cost of one tube is Rs. 100, either the shut down time cost Rs. 200. per hour. Simulate the system for about 6000 hours to run and find the maintenance cost.

Q.15 Explain the advantages and limitation of simulation techniques.