

M. Tech. C.A.D./C.A.M. (CBCS Pattern) Sem-III
PCDS32(B) / PCDS322 - Elective-III : Modelling and Simulation

P. Pages : 1

GUG/W/22/11040

Time : Three Hours



Max. Marks : 70

- Notes :
1. All questions carry equal marks.
 2. Answer **any five** questions.
 3. Assume suitable data wherever necessary.
 4. Use of calculator is permitted.

1. a) Explain the term System-Simulation and model. 7
b) What are the different types of module? Explain with suitable example. 7
2. An empirical distribution has the PDF values recorded at various times as below. 14

Time	0	1	2	3	4	5	6	7
PDF	24	22	20	17	13	8	2	0

Write computer program or solve numerically to produce the random numbers using direct transformation technique. Assume that PDF varies linearly between two consecutive points.
3. A vehicle mechanic takes average 20 min to repair the vehicle. His services time has elevation of 2.5 min and conforms to normal distribution. Mean time between arrival of a customers demanding his services is 15 min and follows exponential distribution. Simulate the system for 200 min. Assume that there was one customer at time $t = 0$. Find average time customer spends in system and idle server time. 14
4. a) Explain transient and steady state of waiting line model. 7
b) Explain the similarity between inventory and queuing system. Hence find equivalence of 7
 - i) Length of queue
 - ii) Time spent in a system
5. If randomly obtained values of CDF is 0.8035 then compute the value of x variate in following cases. 14
 - i) Uniform discrete distribution from 40 to 50.
 - ii) Exponential distribution with mean = 5
 - iii) Normal distribution with mean of 35 and S.D. of 3.
 - iv) Triangular distribution with minimum value = 10 and maximum value = 17.
6. a) What are the facilities available in SIMMOD family of software? 7
b) Differentiate between fixed time advancement and event driven time advancement. 7
7. A blank processed on machine M_1 , and then machine M_2 . Infinite blanks are available for M_1 . Processing time on M_1 as well as on M_2 is 3 min with standard deviation of 0.4 min. The time for porting from M_1 to M_2 is uniformly distributed between 0.6 to 1.5 min. Evaluate how many pieces will be completely machined in 28 min. 14
8. Write short notes on **any two**. 14
 - i) Functional dependences
 - ii) Network type
 - iii) Multimedia database
