

B. Tech. Sem - III (Mechanical Engg.) (2014 COURSE) (CBCS) :

WINTER - 2018

SUBJECT-COMPUTER PROGRAMMING AND SIMULATION

Day: Monday
Date: 03/12/2018

Time: 10.00 AM TO 01.00 PM
Max. Marks:60

W-2018-2314

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Assume suitable data if necessary.

Q.1 Define system. State and describe its components. **(10)**

OR

Q.1 Differentiate between **(10)**
i) Continuous time VS discrete time models
ii) Physical VS mathematical models

Q.2 A drunkard takes a random step in either front, left or right direction with chances of 50%, 20% & 30% respectively. If the length of a step is unit length and the drunkard is initially at (0,0), what is the position of the drunkard after 10 steps (Use following random numbers between 1&100) **(10)**
[7,56,92,63,54,41,87,71,12,19]

OR

Q.2 Describe the steps involved in a simulation study. **(10)**

Q.3 A manufacture of metal pistons finds that on average 12% of his pistons are rejected because they are over sized. What is the probability that a batch of 10 pistons will contain **(10)**
i) No more than 2 rejects ii) At least 2 rejects

OR

Q.3 Life expectancy & an electronic component (in days) has a density function **(10)**
 $p(x)=1/x^2$, for $X \geq 1$ and $p(x)=0$ for $x < 1$. Find
i) Probability that a component lasts between 0 & 1 day
ii) Probability that it lasts between 0 & 10 days?
iii) More than 10 days

Q.4 How do you simulate a water reservoir system? **(10)**

OR

Q.4 Write the algorithm for simulation of a pendulum. **(10)**

P.T.O.

Q.5 An owner of restaurant plans to start drive through cube at his restaurant. He plans for one service counter. Survey showed customer arrival and service patterns as given table. **(10)**

Internal arrival times		Service Times	
Time bet two arrivals (mins)	Probability	Service time (mins)	Probability
2	15%	2	10%
3	25%	3	25%
4	20%	4	30%
5	25%	5	20%
6	15%	6	15%

The owner wants you to simulate this system for simulate of 10 cars arriving at the hop and calculate

- i) Mean waiting time of customers
- ii) Average service time
- iii) Average idle time of server.

Q.5 What are the steps in an inventory system simulation? **(10)**

Q.6 Describe the classical experimental design. **(10)**

OR

Q.6 How does one validate a simulation experiment? **(10)**

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