

30-4-19

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B.E.(B.Tech CFT) END SEMESTER EXAMINATIONS April/May 2019

INDUSTRIAL ENGINEERING

Semester

IE8701 SIMULATION MODELING AND ANALYSIS
(Regulation 2012)

Time: 3 Hours

Answer ALL Questions

Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. Give any two advantages of Simulation.
2. List any two methods of generating pseudo random numbers.
3. What is run test?
4. Generate two uniform random Variate with mean 5 and half spread 3.
5. What is the use of Pokers test?
6. What is model verification?
7. What is simulation clock?
8. Write any four simulation languages.
9. Function of GPSS block GENERATE 20,4,2,2,1
10. What is the use of STORAGE statement in GPSS?



Part - B (5 x 16 = 80 marks)

11. a) Give the step by step procedure for the following with suitable examples :
 - i) Mid Square method of Random number generation
 - ii) Additive congruential method of generation random numbers,
 - iii) Generation of Poission Random variates
 - iv) Generation of Binomial random variates
12. a) Discuss in detail the steps involved in the design of simulation experiments

(OR)

- 12 b)
 - i) Name various test used to find the goodness of fit
 - ii) The table below contains 50 random numbers. Check the goodness of fit of the numbers

98	64	49	25	64	52	20	50	66	12
43	41	28	7	13	10	56	19	34	22
88	41	34	66	69	59	5	26	94	5
86	40	64	93	98	66	3	53	82	22
16	10	46	98	15	92	33	80	46	72

13. a) A man is standing at the center of a grid of roads. The man is unsteady so he can move towards North, East, South or West with equal probability from the current position. Determine the location of the man after 10 moves.

(OR)

- b) Customers are arriving for service, which follow poisson with a mean of 4 per hour. There are one server whose service time follows normal with a mean of 5 hour and a standard deviation of 20 minutes. Give the logical and program flow chart to simulate the system and collect all the relevant statistics

14. a) Write short notes on various blocks of GPSS language

(OR)

- b) A paper seller buys paper for R.2.50 each and sells that for Rs.3 each. Newspaper not sold end of the day as scrap for 30 paise each. Newspaper can be purchased in bundles of 50, 60 or 70. There are 3 types of days may be good, bad and poor with probability 0.35, 0.45 and 0.2 respectively. Daily demand for the newspaper is as given below. Find the optimal number of bundle to be purchased.

Demand	Type of day		
	Good	Fair	poor
40	0.10	0.08	0.44
50	0.12	0.22	0.22
60	0.18	0.42	0.14
70	0.25	0.20	0.12
80	0.35	0.08	0.08

15. a) The inter arrival time of customers in a self service cafeteria follows uniform distribution with a mean of 35 seconds and a spread of 40 seconds. Forty percent of them go to the sandwich counter where one worker makes a sandwich in 60 ± 30 seconds. The rest go to the main counter, where one server serves the prepared food on to a plate in 54 ± 30 seconds. Afterwards all customers must pay a single cashier counter, who takes $25+10$ seconds. For all customers, eating take 20 ± 10 minutes. After eating, 15% of the people go back for desert, spending an additional 10 ± 2 minutes (includes all times serving, paying and eating). Simulate until 100 non-desert customers have left the cafeteria. Give GPSS block diagram and program

(OR)

- b) In a factory the tool crib is manned by a single clerk. The clerk check out tools to mechanics. The time to process a tool request depends on the type of tool request which fall into 2 categories and relevant data are as follows.

Type of request	IAT (sec)	ST (sec)
1	420 ± 360	300 ± 90
2	360 ± 240	100 ± 30

The clerk has been serving the mechanic as FCFS basis. Give the GPSS block diagram to simulate the system for 100 tool checkouts

