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L	Eighth Semester B.E.	Degree	Fyamina	tion Aug	/Sent 202	20
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me:	3 hrs.		2		Max	Marks: 80
ote: i ii	For Regular Students: Answe For Arrear Students : Answer from ea	er any FIVE r any FIVE ach module.	full questio	ons irrespect ns, choosing	ive of modu ONE full q	les. uestion
		Modu		\$. J
a.	What is simulation? Explain w	ith flowchar	t, the steps	involved in si	mulation su	(08 Marks)
b.	A grocery store has only one c					
	random from 1 to 5 minutes ap minutes with probability 0.30,					
	10 customers and find the follo		J.10, 0.10 al	iu 0.20. Deve	iop a siniuia	
	(i) Average waiting time of		1980			
	(ii) Average service time			1 Sec		
	(iii) Average time between an(iv) The probability that serve		e.	AN CONTRACT		
	Use the following set of rand	om number	s for arriva			
	Random digit for service time.	23, 35, 65, 8	81, 54, 03, 8	7, 27, 73, 70.	697	(08 Marks)
a.	Explain the major concepts in	discrete eve		an Write the	flowebart f	or arrival and
	Explain the major concepts in	discrete eve	ent simulatio	on, while the	nowchant n	or arrivar and
	departure events.			Aparticity .		(08 Marks)
b.	departure events. Six dump trucks are used to ha	ive coal for	n the entran	ice of a mine	to a rail roa	(08 Marks) d. Each truck
b.	departure events. Six dump trucks are used to ha is loaded by one of the two loa	ive coal for ders. After l	n the entran oading, a tr	ice of a mine uck immediat	to a rail roa ely moves to	(08 Marks) d. Each truck the scale, to
b.	departure events. Six dump trucks are used to ha is loaded by one of the two loa be weighted as soon as possi weighing time for trucks. Trav	ave coal for ders. After l ible. Both t vel from loa	m the entran oading, a tru- he loaders ders to scale	ace of a mine uck immediat and scale hat e is considere	to a rail roa ely moves to ve first con d negligible	(08 Marks) d. Each truck to the scale, to ne first serve c. After being
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Important Note: 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. 2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

Module-3

- What is the role of maximum density and maximum period in generating random numbers? 5 a. With given seed 45, constant multiplier 21, increment 49 and modulus 40, generate a (08 Marks) sequence of fire random numbers.
 - b. The sequence of numbers 0.54, 0.73, 0.98, 0.11, 0.08 has been generated. Use Kolmogorov Simirnov test with $\alpha = 0.05$ to determine if the hypothesis that the numbers are uniformly distributed on the interval [0, 1] can be rejected. Compare F(X) and $S_N(X)$ on a graph. (08 Marks) $D_{0.05} = 0.565$.
 - OR
- Explain the inverse transformation technique for exponential distribution. Show the 6 a. corresponding graphical interpretation. Explain the acceptance rejection technique.
 - (08 Marks)
 - b. Use the Chi-Square test with $\alpha = 0.05$ to test for whether the data shown are uniformly distributed. The test uses n = 10 intervals of equal length. $\chi^2_{0.05,9} = 16.9$.

			The second second		-				
0.41	0.52	0.73	0.99	0.02	0.47 0.30	0.17	0.82	0.56	
0.05	0.45	0.31	0.78	0.05	0.79 0.71	0.23	0.19	0.82	
0.93	0.65	0.37	0.39	0.42	0.99 0.90	0.25	0.89	0.87	
0.44	0.12	0.21	0.46	0.67	0.83 0.76	0.79	0.64	0.70	
0.81	0.94	0.74	0.22	0.74	0.96 0.99	0.77	0.67	0.56	(08 Marks)
0.01	0.71		0		and the second se				

Module-4

a. List the steps involved in development of a useful model of input data and explain. (08 Marks) 7 Explain how the method of histograms can be used to identify the shape of a distribution. b. With an example, also mention drawbacks of histogram and advantages of Q-Q plot. (08 Marks)

OR

Customers arriving at a busy bank counter in a 5 minutes period between 10 to 2 pm was 8 a. recorded for days given below:

[Arrival/period	0	1	2	3	4 5	6	7	8	9	10	et.
	Frequency	15				8 7		4	3	2	4	
Use	Chi-Square test	to c	heck	whe	ther	the dat	ta f	ollo	ws	Poi	sson	distribut

tion at 5% level of Use Chi-Square test to chi significance. $\chi^2_{0.05,4} = 9.49$. (08 Marks)

- b. The time required for 30 different employs to compute and record the number of hours worked during week days given:
 - 1.88 2.62 1.49 0.35 0.82 2.03 1.54 0.21 0.39 2.03 2.16 0.90 1.90

0.05 0.04 1.73 0.92 2.81 0.63 0.17 0.03 0.45 0.31 0.15 2.03 4.29

5.5 2.16 0.48 0.18

Use the Chi-Square to test the hypothesis that these service times are exponentially distributed at 5% of level of significance. Let the number of intervals be K = 6 and critical (08 Marks) value 9.49.

Module-5

Explain the types of simulation with respect to output analysis. Give atleast two examples. 9 (08 Marks)

b. Explain the concepts of point estimation and interval estimation. (08 Marks)

OR

a. Explain in detail about the model building, verifying and validation in the model building 10 (08 Marks) process through a diagram.

2 of 2

b. Explain 3-steps approach to validation of simulation models by Naylor and Finger. * * * *

(08 Marks)