

TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
Model Question

Exam.	Regular (New Course)		
Level	BE	Full Marks	60
Programme	BCT	Pass Marks	24
Year/Part	III/II	Time	3 Hrs

Subject: - Simulation and Modeling

Course Code:- (ENCT 353)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt **All** questions.
- ✓ The figures in the margin indicate **Full Marks**.
- ✓ Assume suitable data if necessary.

QN	Description	Marks	Chapter No.												
1	Explain the steps in simulation study? What is Monte-Carlo simulation?	4+2	1												
2	Differentiate between static physical model and dynamic physical model.	4	2												
3	What are the advantages of using differential equations for simulation of continuous system? Explain the electronic analog computer model of liver with necessary figure and equation.	2+5	3												
4	What do you mean by queuing system? Explain its elements and characteristics. How can we analyze the performance of M/M/1 queue? Explain with suitable example.	4+4	4												
5	What do you mean by Markov chain? Explain its features with an example.	2+3	5												
6	Differentiate between true random number and pseudo random number? How are pseudo random numbers generated? Explain the method of non-uniform random number generation.	4+3	6												
7	A sequence of 1000 four-digit numbers has been generated and an analysis indicates the following combinations & frequencies: <table><tr><th>Combinations (i)</th><th>Observed Frequency (O_i)</th></tr><tr><td>4 different digits</td><td>545</td></tr><tr><td>3 like digits</td><td>50</td></tr><tr><td>4 like digits</td><td>10</td></tr><tr><td>1 pair</td><td>330</td></tr><tr><td>2 pairs</td><td>65</td></tr></table> Use Poker's test to determine if these random numbers are independent. [Critical value of $\chi^2 = 9.49$]	Combinations (i)	Observed Frequency (O _i)	4 different digits	545	3 like digits	50	4 like digits	10	1 pair	330	2 pairs	65	6	6
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8	Explain verification and validation of a model using suitable example. List some errors during model validation.	3+1	7
9	What is confidence interval estimation? Explain replication of runs method for simulation output analysis.	1+4	8
10	Explain simulation in Python with. Why is it more preferred than JAVA?	4	9
11	What is computer network simulation? Explain its significance.	4	10