HIMALAYAN WHITEHOUSE INTERNATIONAL COLLEGE

2024

B.I.T / Sixth Semester/First Internal Assessment

Time:2.0 hours Full/Pass Marks: 50/20

Simulation and Modeling

Candidates are required to give answers in their own words as far as practicable.

The marks allotted for each sub-question is specified along its side.

Choose any three questions from questions 1 to 4, and answer all other questions.

GROUP A

1.		Define and explain the concept of system. Explain the limitations and areas of applications of simulation techniques.	3+5
2.		What is queuing system? Explain different queuing disciplines.	3+5
3.		What do you mean by analog methods? Explain the analog computer model of a automobile suspension system.	2+6
4.		Draw a flowchart that visually represents the steps involved in a simulation study also describe each step in detail.	8
5.		Write the features of Markov chain.	2

GROUP B

6. Explain the properties of random numbers. A sequence of 1,000 four-digit number has been generated & an analysis indicates the following combinations and frequencies. Based on poker test check whether the numbers are independent. Use $\alpha = 0.005$ and $X^2_{0.05,4}=9.49$ 4+8

Combination	Observed Frequencies
Four Different Digits	5150
One pair	4225
Two Pairs	250
Three of a kind	362
Four of kind	13
Total	10,000

7.		Write the K-S test algorithm of testing random numbers. A set of 100 numbers have been generated as below: 4+8 0.34 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 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 0.17 0.99 0.46 0.05 0.66 0.10 0.42 0.18 0.49 0.37 0.51 0.54 0.01 0.81 0.28 0.69 0.34 0.75 0.49 0.72 0.43 0.56 0.97 0.30 0.94 0.96 0.58 0.73 0.05 0.06 0.39 0.84 0.24 0.40 0.64 0.40 0.19 0.79 0.62 0.18 0.26 0.97 0.88 0.64 0.47 0.60 0.11 0.29 0.78 **Test these values for uniform distribution using Chi-square test.** The critical value from table is $\chi_{0.05,9}=16.9$
7.		
8.		
9.		
10.		
11.		

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