

**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.**

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| **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 α = 0.005 and X20.05,4=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 χ0.05,9=16.9 |
| **7.** |  |  |
| **8.** |  |  |
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