CLASS:IMSC   IMSC   SEMESTER : 7th
BRANCH: MATH AND COMPUTING   SESSION : MO/2022

SUBJECT: CA603 SYSTEM SIMULATION AND MODELLING
TIME: 03 Hours   FULL MARKS: 50

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates

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Q.1(a)	Discuss the principles used in Modeling.	[5]
Q.1(b)	Describe the full Corporate model with detail of each sub-segment model.	[5]

Q.2(a) Draw a cobweb model for the following market: [5]
        D=12.4-1.2P
        S=8.0-0.6P_{-1}
        P_0=1.0

Q.2(b) Discuss the features of CSMP-III. Simulate the simulation of an autopilot system.   [5]

Q.3(a) Explain the multi-segment models, represent its system diagrams.   [5]
Q.3(b) Explain the realistic market model using modified exponential growth model.   [5]

Q.4(a) The random numbers are given as follows: 0.26,0.88,0.12,0.52,0.23,0.43,0.51,0.66,0.79,0.65. Use the   [5]
        KS-Test to determine whether the numbers are uniformly distributed between[0,1] interval.(Given the
        theoretical value at $\alpha = 0.5$ and $N = 10$ is 0.410.)

Q.4(b) Develop a random variates generator for a random variable with the pdf: [5]
$$f(x) = e^{2x}, \quad -\infty < x < \infty$$
$$e^{-2x}, \ 0 < x < \infty$$

Q.5(a) Discuss the simulation programming tasks used in discrete event simulation with the help of neat and   [5]
        clean figure.
Q.5(b) Simulate the telephone system using the different steps involved in simulation with inclusion of delayed   [5]
        calls.