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Roll No

IT-7004(3)-CBGS

B.E. VII Semester

Examination, June 2020

Choice Based Grading System (CBGS)

Simulation and Modeling

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.

ii) All questions carry equal marks.

1. a) What do you mean by continuous and discrete system? Explain it with suitable examples. Give difference between linear and non linear system.
b) Explain the concept of system and environment in simulation. Also discuss the various advantages and disadvantages of simulation. Discuss the various types of simulation.
2. a) Discuss the role of simulation in model evaluation and studies. Explain in brief about static and dynamic models.
b) Briefly write the different steps involved and four guiding principles associated with simulation modeling.
3. a) Explain the concept of Monte Carlo method of computer based simulation in detail. Also write its application areas.
b) What do you mean by the term analog and hybrid simulation? Explain the various steps required in building a financial simulation model for an organization.
4. a) Describe the exponential growth model and decay model. Explain the steps required in validation of a SD model.
b) Explain the simulation of system dynamics for waiting times in single server queuing system. Describe the characteristics of queuing system.

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5. a) What are the system dynamics diagrams? Explain in brief. Also describe about the calumnious system models.
b) Explain the concept of discrete and continuous probability function in simulations. Differentiate between random numbers and pseudo random numbers.

6. a) Discuss stochastic variables and process in details. How could random numbers that are uniform on the interval $[0,1]$ be transformed in to random numbers that are uniform on the interval $[-11,17]$?
b) Discuss the inverse transformation method for generating the non uniform continuous random number using the following function.
$$F(x) = 1 / (x + A); 0 \leq x \leq 1$$
$$= 0, \text{ elsewhere.}$$

7. a) What is logistic curves and multi segments models? Write the classification of simulation languages in brief.
b) Explain the simulation in GPSS with the help of a block diagram for the single server queue simulation.

8. a) Write short notes on any two:
 - i) Markov chain
 - ii) ARENA
 - iii) Queuing theory in computer system
b) Develop a model and write a program in dynamo for inventory control.

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