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Total No. of Pages : 02

Total No. of Questions : 09

**B.Tech (IT) (Sem.-7)**  
**MODELLING AND SIMULATION**  
Subject Code : IT-416  
Paper ID : [A0534]

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

1. **SECTION-A** is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. **SECTION-C** contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

**SECTION-A****Q1. Answer briefly :**

- a) What are various advantages of simulation?
- b) What do you mean by system analysis and design?
- c) What do you understand by the term "Modeling process"?
- d) What do you mean by hybrid systems?
- e) Define the terms "activity" and "state of a system".
- f) Differentiate between simulation time and time taken to carry out computations.
- g) Give any four examples where simulation is advantageous.
- h) What do you mean by a discrete event?
- i) Explain real time simulation.
- j) Write any four points that relates databases and simulation.

### SECTION-B

- Q2. Discuss various types of systems with the help of appropriate examples. Can a system be intrinsically continuous but information about them is only available at discrete interval of times? If yes, explain.
- Q3. Explain verification and validation modeling procedures with the help of appropriate examples.
- Q4. Draw a block diagram for simulation of a time sharing computer system; also describe in brief major components of desired system.
- Q5. Discuss the use of Artificial Intelligence (AI) in area of modeling and simulation with the help of appropriate examples.
- Q6. Discuss various reasons for choosing GPSS and SIMSCRIPT as most widely used simulation languages.

### SECTION-C

- Q7. What do you mean by continuous system simulation? Differentiate between differential and partial differential equation models with the help of any example.
- Q8. Suppose that it has been decided to make a study via a simulation model. Discuss whether the simulation should be static or dynamic, deterministic or stochastic, and continuous or discrete for the following systems:
- a) A major section of an existing factory.
  - b) An freeway interchange that has experienced severe congestion.
  - c) The shuttle-bus operation for a rental car agency at an airport.
  - d) A battlefield communication network.
- Q9. What are simulation languages and their usage? Discuss various features of any simulation language you have studied with the help of suitable code fragments.