

Time: 2 Hours

Total marks: 75

N.B.

- (1) All questions are compulsory.
- (2) Figures to the right indicate full marks.
- (3) Assume additional data if necessary but state the same clearly.
- (4) Mixing of sub-questions is not allowed.
- (5) Use of calculators and statistical tables are allowed.

**Q.1 Attempt Any three of the following:**

**15**

- a) List the different challenges face during the problem-solving using simulation in real life systems.
- b) Explain framework of conceptual model.
- c) Write a detailed note on continuous time simulation approach.
- d) Explain Interconnections and Combinatorial complexity using Job Shop Systems.
- e) What are project specifications for simulation?
- f) Write a brief note on sampling from standard statistical distributions.

**Q.2 Attempt Any three of the following:**

**15**

- a) Write the various advantages and disadvantages of empirical distribution.
- b) Explain the approaches used to perform black box validation.
- c) What are the modes of simulation models that can be used to execute in any logic?
- d) Explain how system dynamics methods is different from discrete event modelling.
- e) Describe the various forms of simulation experiments.
- f) Discuss Informal approaches to search experimentation.

**Q.3 Attempt Any three of the following:**

**15**

- a) List and explain different types of models.
- b) What do you mean by level of abstraction in simulation?
- c) Define in brief system dynamics with an example.
- d) Describe Asynchronous and Synchronous time models in agent base models.
- e) Elaborate simulation modelling methods in details.
- f) Explain the process of building agents-based models.

**Q.4 Attempt Any three of the following:**

**15**

- a) What is state chart? Explain state transition in detail.
- b) Explain randomness in system dynamics model.
- c) Discuss the role of assumptions in agent-based model.
- d) Design a state chart to represent airport system.
- e) How to view and debug State charts at runtime?
- f) Explain Discrete event simulation method.

**Q.5 Attempt Any three of the following:**

**15**

- a) Explain the various purpose and advantages of simulation.
- b) Discuss the purpose and need of simulation with real life examples.
- c) State the data significance in conceptual modelling.
- d) Describe database connectivity objects offered by AnyLogic with the help of example.
- e) Demonstrate the use of discrete event simulation method.
- f) Explain the different procedures of generating random numbers.

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