

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) What are the challenges face during problem solving using simulation in real systems?
- b) Explain Interconnections and Combinatorial complexity using job shop systems.
- c) Discuss in detail various disadvantages of simulation.
- d) Which method do we use to deal with initialization bias? Discuss any one of them.
- e) Explain time-slicing approach with Telephone Call Centre simulation.
- f) Write a note on sampling from standard statistical distributions.

Q.2 Attempt Any three of the following:

15

- a) What is simulation optimization? Discuss the shortcomings of its use.
- b) Explain the approaches used to perform black box validation.
- c) Define Informal approaches to search experimentation.
- d) Explain how system dynamics methods is different from discrete event modelling.
- e) List the methods proposed to construct a confidence interval for output data and explain the batch means method to achieve it.
- f) Write Welch's method in detail.

Q.3 Attempt Any three of the following:

15

- a) Explain the types of standard and custom networks used in AnyLogic draw neat diagram of each.
- b) Describe Asynchronous and Synchronous time models in agent base models.
- c) Elaborate simulation modelling methods in details.
- d) Explain three callers' problem in detail.
- e) What do you mean by level of abstraction in simulation?
- f) Explain the area of application of simulation.

Q.4 Attempt Any three of the following:

15

- a) Define state-chart and explain Condition triggered events in details.
- b) Explain architecture of multi-method modelling in details.
- c) Draw and explain examples of stock and flow diagrams.
- d) Explain the role of Assumptions in ABM.
- e) Design a state chart to represent Airport system.
- f) Explain how to view and debug State-charts at runtime?

Q.5 Attempt Any three of the following:

15

- a) State the features of conceptual modelling and explain its requirements.
- b) Explain the modes simulation models can be used to execute in AnyLogic on a given scale.
- c) Describe database connectivity objects offered by any logic with the help of example.
- d) Demonstrate the use of discrete event simulation method.
- e) Write a short note on multi-method modelling.
- f) Explain the different procedures of generating random numbers.
