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Printed Pages : 3 MCA – 402

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 1473 Roll No.

M. C. A.

(SEM. IV) EXAMINATION, 2006-07

MODELING & SIMULATION

Time : 3 Hours] *[Total Marks : 100*

Note : *Attempt **all** questions.*

1 Attempt any **two** parts of the following :

(a) Differentiate between static mathematical and dynamic mathematical model. Take suitable examples to illustrate the use of these models. **10**

(b) Name four principal entities, attributes and activities to be considered for the simulation of the following systems : **10**

(i) University registration system

(ii) Examination system

(iii) Railway reservation system.

(c) Differentiate between continuous and discrete systems with suitable examples. **10**

2 Attempt any **two** parts of the following:

(a) Draw a Cobweb model for the following market : **10**

$$D = \frac{17.9}{p^{1/2}} - 4.6$$

$$9S = 5.0\left(P_{-1} - 1\right)$$

Assume the market is always cleared.

(b) Explain distributed lag model with an example. Demonstrate its use. **10**

(c) What are types of system simulation ? Explain each with example. **10**

3 Attempt any **two** of the following :

(a) Differentiate between Monte Carlo computation and stochastic simulation. **10**

(b) Explain the following :

(i) Simulation of continuous systems. **5**

(ii) Simulation of water reservoir system. **5**

(c) What is the method of testing random number generation of nonuniformly distributed random numbers ? **10**

4 Attempt any **two** of the following :

(a) Two competing companies invest funds in capital equipment to improve their positions. The rate at which each invests funds decreases linearly as their own investment increases but increases linearly as their competitor's investment increases. Draw a diagram from which to simulate the competition and determine under what conditions the investments will stabilize. **10**

(b) What type of a model is the world model ? Explain it in detail. **10**

(c) Explain Exponential Decay models. Also describe logistic curves. **10**

5 Attempt any **two** of the following :

(a) CSMP-III and MODSIM – III. **10**

(b) Continuous and discrete simulation language and expression based language. **10**

(c) Simulation of PERT networks. **10**
