Printed Pages—3   **MCAE22**

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

PAPER ID : 2147   **Roll No.** ☐☐☐☐☐☐☐☐☐☐

M.C.A.

(SEM. V) THEORY EXAMINATION 2011-12

SIMULATION AND MODELLING

Time : 3 Hours   *Total Marks : 100*

Note :— (1) Attempt **all** questions.

(2) All questions carry equal marks.

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

(a) Define the system. Explain the system simulation and system modelling in comparative manner.

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

(i)   a super market

(ii) a barber shop

(iii) banking system.

(c) What are the different segments of a corporate model ? Describe each segment.

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

(a) With a suitable example illustrate the general numerical computation technique of simulation based on a discrete model.

(b) "It should be understood that there is not a single model for any given system. In the course of a study many different models are likely to be considered as understanding of the system behaviour increases". Elaborate.

(c) Use a Cobweb Model to investigate a market in which the supply (S) and demand (D) functions are :

$$D = \frac{17.91}{P^{1/2}} - 4.66$$
$$9\,S = 5.0(P_{-1} - 1)$$

Assume the market always cleared.

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

(a) Discuss the simulation of auto pilot system.

(b) Describe the comparative study of fixed time step vs. event to event model.

(c) What are the different methods for test of randomness ? Explain any one.

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

(a) Draw the structure of a system dynamic model. Explain the system dynamic diagram of population growth.

(b) Differentiate between exponential growth model and modified exponential growth model.

(c) Illustrate the use of SIMSCRIPT for defining the Telephone System Model.

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

   (a)   Show that the activities in a project network can be ordered topologically if and only if the network contain no cycles.

   (b)   Discuss the different factors in selection of a discrete system simulation language.

   (c)   Explain the following in connection with CPM and PERT :

      (i)   Critical Path

      (ii)   Topological Ordering of Activities

      (iii) EST and EFT

      (iv)   LST and LFT.