(01/13-II)

2221

M.C.A. (Third Year) EXAMINATION

(New Scheme)

MCA-DE-31

SYSTEM SIMULATION

Time : Three Hours *Maximum Marks :* 70

Note : Attempt any *Five* questions. All questions carry equal marks.

1. What do you mean by system ? Draw and explain the block diagram of a system of your own choice. Enlist the entities and activities of the system. Also explain various types of system. 14

2. What is meant by system simulation ? List and explain various steps of a simulation. List benefits and limitations of simulation. 14

3. Discuss inventory problem. Draw and explain the flowchart for simulating an inventory problem. Also write down a program in high level language to simulate the problem. 14

4. Derive expressions for probability of exactly 'n' customers being in the system, average number of customers in the system and average queue length at any given time say 't' for a queuing system, assuming Poisson arrival pattern, negative exponential service times, a single server and first-come-first-serve discipline. 14

5. Write notes on the following :

   (a) Generation of Poisson Variates

   (b) Monte Carlo computation. 7+7=14

6. Discuss various techniques for variance-reduction. 14

7. Discuss block-structured continuous simulation languages. Draw and explain the block diagram for the problem of a host-parasite system. 14

8. What was the problem with block-structured continuous simulation languages that has been overcome by expression-based languages ? Discuss the common characteristics of expression based languages. 14

9. Discuss discrete system simulation languages. Explain the classification of discrete system simulation languages. Also discuss the factors affecting the selection of discrete system simulation languages. 14

10. Discuss the following : 7+7=14

    (a) Chemical reactor

    (b) Fixed tine-step and event-to-event model.