

AR-2521

Faculty of Engineering & Technology
M.C.A. Second Year Semester-II (C.G.S.) Examination
ELECTIVE-I : MODELLING AND SIMULATION
(15533)

Paper—4 MCA 5

Time : Three Hours]

[Maximum Marks : 80

INSTRUCTIONS TO CANDIDATES

- (1) All questions carry marks as indicated.
- (2) Due credit will be given to neatness and adequate dimensions.
- (3) Assume suitable data wherever necessary.
- (4) Use pen of Blue/Black ink/refill only for writing the answer book.

1. (a) Explain the following System models in brief with suitable examples :
 - (i) Static Physical models
 - (ii) Static Mathematical models. 8
- (b) Explain the concept of system environment and stochastic activities in brief. 6

OR

2. (a) Describe the various principles used in modelling. 7
 - (b) Name three or four principal entities, attributes and activities to be considered if you were to simulate the operation of :
 - (i) gasoline filling station
 - (ii) barber shop
 - (iii) a cafeteria. 7
3. (a) Explain the concept of Distributed Lag models with example. 7
 - (b) Explain Numerical Computation Technique for Discrete models. 6

OR

4. (a) Define the term continuous system. Explain, how linear differential equations with constant coefficients are used to describe wheel suspension system of an automobile. 7
- (b) Explain :
 - (i) Hybrid Computers
 - (ii) Digital-Analog Simulators. 6
5. (a) Explain the concept of continuous probability functions in simulation. 7
- (b) Describe in brief numerical evaluation of continuous probability functions. 6

OR

6. (a) Explain the concept of continuous uniformly distributed random numbers. 7
- (b) Approximate the following function with 10 straight lines at equally spaced intervals of x :

$$Y = 0.5093 + 0.02 \sin x, 0 \leq x \leq \pi/2$$
 6
7. (a) Explain rudiments of Queuing theory. 6
- (b) Describe simulation of a PERT network. 7

OR

8. (a) Explain analysis of an activity network. 6
- (b) What is two server queue ? Explain its simulation. 7
9. (a) Explain the concept of poison variate with suitable example. 7
- (b) Describe regression analysis with example. 6

OR

10. (a) What is simulation runs ? How its evaluation is carried out ? 7
- (b) Explain the following concepts :
 - (i) Validation
 - (ii) Variance reduction techniques. 6
11. (a) Differentiate between GPSS and SIMSCRIPT. 6
- (b) Explain, how gathering statistics is carried out in manufacturing shop with GPSS. 8

OR

12. (a) Explain how simulation of a supermarket is done with GPSS. 10
- (b) Explain the following concepts in brief :
 - (i) GPSS symbols
 - (ii) GPSS control statements. 4