

B.TECH
(SEM IV) THEORY EXAMINATION 2017-18
SIMULATION AND MODELING

Time: 3 Hours

Total Marks: 100

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt all questions in brief. 2 x 10 = 20

- a. Define system environment.
- b. Write the component of system with example?
- c. What is system modeling?
- d. Compare Analytical & simulation model?
- e. What are the properties of C.D.F.?
- f. What do you mean by parameter estimation?
- g. Define Service utilization.
- h. What are arrival Patterns?
- i. What do you mean by reliability estimation?
- j. Describe the areas of application of simulation?

SECTION B

2. Attempt any three of the following: 10 x 3 = 30

- a. Write three Principal entities, attributes and activities to be considered for the simulation of the following system
 - (a) A University Library
 - (b) Railway reservation system
 - (c) A hospital emergency room
 - (d) A fast food restaurant
- b. What is the model? What are the types of system model and what is the difference between static and dynamic model? Give example?
- c. Explain Cobweb Models. Draw suitable diagram.
- d. Describe the cost in queuing problems. Define server utilization and system performance.
- e. Explain any two parts the following
 - (i) Capital recovery model
 - (ii) Inventory system model
 - (iii) Interpretation of confidence interval of a parameter

SECTION C

3. Attempt any one part of the following: 10 x 1 = 10

- (a) What is the Simulation? What are the need, advantage and disadvantage of simulation and modeling?
- (b) Write principle and steps in creating system models.

4. Attempt any one part of the following: 10 x 1 = 10

- (a) Write a short notes of multivariate and time series input model

(b) What do you mean by event and data modeling?

5. Attempt any *one* part of the following:

10 x 1 = 10

(a) What are GOODNESS -OF-FIT tests? The following table shows the distribution of digits in numbers chosen at random from a telephone directory:

| | | | | | | | | | | |
|------------|------|------|-----|-----|------|-----|------|-----|-----|-----|
| Digits: | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Frequency: | 1026 | 1107 | 997 | 966 | 1075 | 933 | 1107 | 972 | 964 | 853 |

Test whether the digits may be taken to occur equally frequently in the directory.

(χ^2 at 5% level of significance for 9 d.f. is 16.919.)

(b) What do you mean by Numerical Computation techniques for continuous and discrete model?

6. Attempt any *one* part of the following:

10 x 1 = 10

(a) What do you mean by Gathering statistic, Measuring Occupancy and utilization?

(b) What do you mean by service delay and transit times estimator?

7. Attempt any *one* part of the following:

10 x 1 = 10

(a) Explain Pi value estimation.

(b) Explain transfer line model in detail.