Reg. No. : …………………………

Name   :…………………………

Seventh Semester B.Tech. Degree Examination, Dec. 2016

(2013 Scheme)

13.702: SYSTEM ANALYSIS AND DESIGN (N)

Time: 3 Hours   **Max. Marks: 100**

Instructions: 1) Answer **all** questions in **Part-A** and **any one full** question from **each** module in Part-B.
2) Any missing data shall be assumed and all assumptions shall be clearly stated.
3) Use of **statistical tables** allowed.

PART - A

1. Distinguish between 'Open loop' and 'Closed loop' systems.

2. Indicate the various symbols used for flow diagramming of system dynamics models.

3. What are table functions?

4. What are the fundamental modes of system behavior?

5. What do you mean by time constant of a system?

6. What is the principle of system dynamics modeling related to rates?

7. What do you mean by 'policy design' in SD models?

8. How do you model infinite order delays for capacity acquisition?

9. Name the types of equations used in system dynamics models.

10. Enlist any two softwares used for modeling system dynamics problems.

(2 x 10 = 20 marks)

PART B

MODULE – I

11. Develop causal loop diagram for the following situation and explain.

Commodities, in general, face price fluctuations. One explanation for such a phenomenon is given below.

In case of large production of the commodity, the price tends to come down. The low price, however, encourages the consumers to increase demand, but it acts as a disincentive to the producers. *(20 marks)*

OR

12. (a) Enlist the characteristics of delays. Explain first and third order delays.
(10 marks)

(b) Draw likely table function relationships between the following sets of variables and explain:
(i) Demand as a function of price.
(ii) Crime rate as a function of poverty. *(10 marks)*

MODULE – II

13. Explain in detail the behavior of pure second-order negative feedback system using analytical approach with suitable example. *(20 marks)*

OR

14. Discuss the following modes of dynamic behavior:
(i) Goal seeking and (ii) Oscillation *(20 marks)*

MODULE – III

15. Explain the algorithm for Euler integration. Apply the algorithm to an inventory model where the desired inventory is 100, the initial inventory is 90 and the incremental time step is 1. *(20 marks)*

OR

16. Discuss in detail the modeling tools used for model aggregation and boundary fixing in system dynamics modeling. *(20 marks)*

MODULE – IV

17. Explain the Bass Diffusion model for new product growth. Extend the model to incorporate growth in the size of the total market. *(20 marks)*

OR

18. Write short notes on:
(i) Optimization with SD models;
(ii) Software packages for SD modeling. *(20 marks)*

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