No. of Printed Pages : 3

MS-51(S)

MANAGEMENT PROGRAMME

Term-End Examination

00049

June, 2017

MS-51(S) : OPERATIONS RESEARCH

Time : 3 hours *Maximum Marks : 100*

(Weightage : 70%)

Note : *Section A has six questions, each carrying 15 marks. Attempt any 4 questions from this section. Section B is compulsory and carries 40 marks. Attempt both questions. Use of calculator is permissible.*

SECTION A

1. "OR techniques are gaining acceptance and respect day-by-day as they improve a manager's decision making effectiveness." Comment.

2. Consider the transportation problem presented in the following table :

Origin	Destination				Capacity
	1	2	3	4	
1	20	22	17	4	120
2	24	37	9	7	70
3	32	37	20	15	50
Requirement	60	40	30	110	240

Find an initial basic feasible solution of the problem by using Vogel's Approximation Method.

3. "Goal programming appears to be the most appropriate, flexible and powerful technique for complex decision problems involving multiple conflicting objectives." Discuss.

4. People arrive at a cinema ticket booth at a Poisson distributed arrival rate of 25 per hour. Service time is exponentially distributed with an average time of 2 minutes. Calculate the mean number in the waiting line, the mean waiting time, the mean numbers in the system and the mean time in the system.

5. What is Monte Carlo simulation ? Explain the use of random numbers to generate probabilistic events.

6. "Inventory is a part and parcel of every facet of business life. Without it no business activity can be performed." Comment.

SECTION B

7. Two kinds of cattle feed are available to a dairy farmer. Mormilk costs ₹ 20 per unit while Gromilk is ₹ 40 per unit. The nutrient contents of these food are as follows :

Nutrients	Nutrient Contents	
	Mormilk	Gromilk
N_1	40	20
N_2	3	12
N_3	18	3

The minimum requirements of the three nutrients are 200, 36 and 54 units. What quantities in food units should be bought in order to minimise the cost ?

8. Write short notes on any ***three*** of the following :

   (a) Poisson Distribution

   (b) Sensitivity Analysis

   (c) EOQ Model II

   (d) M/M/1 System

   (e) Saddle Point