16/05/17

Roll No. .....

8852

Printed Pages : 4

BT–8 / M–17
OPERATION RESEARCH
Paper–ME–406E

Time allowed : 3 hours] *[Maximum marks : 100*

Note : *Attempt five questions in all, selecting at least one question from each unit. All questions carry equal marks. Assume the missing data, if any.*

Unit–I

1. Write a detailed note on the use of models for decision making. The answer should specifically cover the following :

(a) Need for model building

(b) Type of model appropriate to the situation.

(c) Steps involved in the construction of the model. 20

2. Show by Simplex Method that the following L.P. problem has infinite number of non-basic feasible solutions.

maximize $Z = 4x_1 + 10x_2$,

subject to $2x_1 + x_2 \leq 10$,

$2x_1 + 5x_2 \leq 20$,

$2x_1 + 3x_2 \leq 18$,

$x_1, x_2 \geq 0$.

Unit–II

3. Find the optimum solution to the following transportation problem in which the cells contain the transportation cost in rupees.

	W_1	W_2	W_3	W_4	W_5	Available
	7	6	4	5	9	
	8	5	6	7	8	
	6	8	9	6	5	
	5	7	7	8	6	
Required	30	30	15	20	5	100 (Total)

20

4. A factory has four machines to do three jobs. Each job can be assigned to only one machine. The cost of each job on each machine is given in the following Table :

	Machine			
Job	A	B	C	D
X	18	24	28	32
Y	8	13	17	19
Z	10	15	19	22

What are the job assignments which will minimize the cost ?

20

Unit–III

5. Two persons A & B work on the station assembly line. The distributions of activity times at their stations are :

Time in sec.	Time frequency for A	Time Frequency for B
10	3	2
20	7	3
30	10	6
40	15	8
50	35	12
60	18	9
70	8	7
80	4	3

(a) Simulate operation of the line for eight items.

(b) Assuming B must wait until A completes the first item before starting work, will he have to wait to process any of the other eight items ? 20

6. Explain the various steps involved in the Decision Theory Approach. Which are the decision criterions available for the condition of uncertainty ? 20

Unit–IV

7. Ships arrive at a port at the rate of 1 in every 4 hours with exponential distribution of inter arrival times. The time a ship occupies a berth for unloading has exponential distribution with an average of 10 hours. If the average delay of ships waiting for berths is to be kept below 14 hours, how many berths should be provided at the port ? 20

8. Explain Theory of Games and discuss in detail the importance of terminology used in game theory. 20