

Roll No. ....

Total Pages : 3

**BT-8/D-17**

**38052**

**OPERATION RESEARCH**

Paper : ME-406 E

Time : Three 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. Discuss the significance and scope of operation research in modern management. 20

2. Use 'big-M' method to maximize  $Z = 3x_1 + 2x_2$ , subject to constraints  $2x_1 + x_2 \leq 1$ ,  $3x_1 + 4x_2 \geq 4$ ,  $x_1, x_2 \geq 0$ . 20

**UNIT-II**

3. Find the basic feasible solution of the following transportation problem by north-west corner rule. Also find the transportation plan. <http://www.kuonline.in>

	1	2	3	4	5	Available
4	3	1	2	6		
5	2	3	4	5		
3	5	6	3	2		
2	4	4	5	3		

Required 60 60 30 40 10 200 (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. Define simulation. What are the advantages and limitations of the simulation technique ? 20

6. Under an employment promotion programme, it is proposed to allow sale of newspaper on the buses during peak hours. The vendor can purchase the newspaper at a special concessional rate of 25 paise/copy against the selling price of 40 paise. Any unsold copies, however is a dead loss. The vendor has estimated the probability distribution for the number of copies demanded :

No. of copies :	15	16	17	18	19	20
Probability :	0.04	0.19	0.33	0.26	0.11	0.07

- (a) Compute EPPI. 10
- (b) How many copies should be ordered so that his expected profit will be maximum ? 10

**UNIT-IV**

7. A library wants to improve its service facilities in terms of the waiting time of its borrowers. The library has two counters at present and borrowers arrive according to Poisson's distribution with arrival rate 1 every 6 minutes and service time follows exponential distribution with a mean of 10 minutes. The library has relaxed its membership rules and a substantial increase in the number of borrowers is expected. Find the number of additional counters to be provided if the arrival rate is expected to be twice the present value and the average waiting time of the borrower must be limited to half the present value. 20
8. Define the rules for Game Theory. Explain in detail with an example, Rule 1 i.e. 'look for a pure strategy (Saddle point)'. 20
- 

<http://www.kuonline.in>

Whatsapp @ 9300930012

Your old paper & get 10/-

पुराने पेपर्स भेजे और 10 रुपये पायें,

Paytm or Google Pay से