

Roll No.

Total No. of Pages : 03

Total No. of Questions : 09

B.Tech.(ME) (E-I 2012 Onwards) (Sem.-6)

OPTIMIZATION TECHNIQUES

Subject Code : DE/ME-3.2

M.Code : 71264

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Answer briefly :

- (a) Classify model by function.
- (b) Write the limitations of OR Models.
- (c) What is certainty in linear programming?
- (d) Define key column in simplex method.
- (e) What do you mean by unbalanced transportation problem?
- (f) Define utilization factor in queuing model.
- (g) Define interfering float.
- (h) Write two limitations of linear programming.
- (i) List two uses of replacement model.
- (j) Name any four mathematical models.

SECTION-B

2. Discuss probabilistic dynamic programming.
3. Use two phase method to

$$\text{Maximize } Z = 5X_1 - 3X_2 + 3X_3$$

$$\text{Subject to : } 2X_1 + X_2 - 6X_3 = 20$$

$$6X_1 + 5X_2 + 10X_3 \leq 76$$

$$8X_1 - 3X_2 + 6X_3 \leq 50$$

$$X_1, X_2, X_3 \geq 0$$

4. The purchase price of a machine is Rs52000. The installation charges amount to Rs 14400 and its scrap value is only Rs 6400. The maintenance cost is given below :

Year	1	2	3	4	5	6	7	8
Maintenance cost in Rs.	1000	3000	4000	6000	8400	11600	16000	19200

After how many years should the machine be replaced?

5. Discuss elements of a queuing system.
6. How dynamic programming differ from linear programming.

SECTION-C

7. Consider the following unbalanced transportation problem

	1	2	3	Supply
1	5	1	7	10
2	6	4	6	80
3	3	2	5	15
Demand	75	20	50	

Since there is not enough supply , some of the demands at these destinations may not be satisfied. Suppose there are penalty costs for every unsatisfied demand unit which are given by 5,3 and 2 for destination 1,2 and 3 respectively. Find optimal solution.

8. A company has one surplus truck in each of the cities A,B,C,D and E and one deficient truck in each of the cities 1,2,3,4,5 and 6. The distance between the cities in kilometers is shown below. Find the assignment of trucks from cities in surplus to cities in deficit so that the total distance covered by vehicles is minimum?

	1	2	3	4	5	6
A	12	10	15	22	18	8
B	10	18	25	15	16	12
C	11	10	3	8	5	9
D	6	14	10	13	13	12
E	8	12	11	7	13	10

9. Explain the similarities and differences between CPM and PERT.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.