Roll No. | | | | | | | | | | | | | Total No. of Pages : 03

Total No. of Questions : 18

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

Answer briefly :

1. What do you mean by unbounded solution in graphical method?
2. Define key row and key column in simplex method.
3. What are the limitations of Graphical Methods?
4. Write the advantages of linear programming.
5. Define assignment model.
6. What is sensitivity analysis in assignment problem?
7. Define total time in the system in queuing model.
8. What do you understand by critical activities?
9. List two uses of replacement model.
10. Name any four mathematical models.

SECTION-B

11. Discuss probabilistic dynamic programming.

12. Use Big M method to :

Minimize $Z = 12X_1 + 20X_2$

Subject to: $6X_1 + 8X_2 >= 100$

$7X_1 + 12X_2 >= 120$

$X_i, X_2 >= 0$

13. Solve the assignment problem :

	1	2	3	4	5
A	11	17	8	16	20
B	9	7	12	6	15
C	13	16	15	12	16
D	21	24	17	28	26
E	14	10	12	11	13

14. Find the cost per period of individual replacement policy of an installation of 300 lights bulbs, given the following :

a) Cost of replacing individual bulb is Rs. 2.

b) Conditional probability of failure:

Week No.	0	1	2	3	4
Conditional probability of failure :	0	0.1	0.3	0.7	1

Also calculate the number of light bulbs that would fail during each of the four weeks.

15. Define Feasible solution, Basic Feasible solution, Optimal solution, Non-Degenerate Basic Feasible solution and Degenerate Basic Feasible solution in Transportation problem.

SECTION-C

16. Discuss sensitivity analysis of models.

17. Explain Two Phase method in detail.

18. A Project schedule has the following characteristics :

Activity	t_0	t_m	t_p
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
5-6	3	6	15
4-6	2	5	8

a) Draw the project network and identify all the path through it.

b) Compute Expected project length.

c) Calculate standard deviation and variance.

d) What is the probability that the project will be completed no more than 4 weeks later than expected?

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.