L – 5533

Reg. No. : ....

Name : ....

Fourth Semester M.Com. Degree Examination, March 2021

Elective : Finance/Marketing

CO243F/CO244M : MANAGEMENT OPTIMISATION TECHNIQUES

Common for CO243F (2014 Admission to 2017 Admission) /
CO244M (2015 Admission to 2017 Admission)

Time : 3 Hours   Max. Marks : 75

SECTION – A

Answer the following questions. Each question carries 2 marks.

1. What do you mean by Modeling Techniques? List out various Modeling Techniques.

2. What do you mean by Degeneracy in Linear Programming?

3. What are the essentials of Linear Programming Problem?

4. What is a transportation Problem?

5. What are the types of Assignment Problem?

6. What do you mean by value of a game in Game theory?

7. Distinguish between a pure strategy and a mixed strategy.

8. What do you mean by a dummy activity in Network Analysis?

9. What do you mean by the term critical path in Network Analysis?

10. What do you mean by Arrival pattern in Queuing Theory?

(10 × 2 = 20 Marks)

SECTION – B

Answer **any five** of the following. Each question carries **5** marks.

11. List out the steps in Graphical method of solving a LPP.

12. What do you mean by unbalanced Transportation Problem? Explain briefly how it is solved.

13. What do you mean by travelling salesman Problem? Explain the steps in it.

14. What do you understand by Game Theory? What are the properties of Two-person Zero-sum game?

15. Explain the need for Inventory Control Models.

16. A project schedule has the following characteristics as shown in the Table:

Project Schedule

Activity	Name	Time	Activity	Name	Time (days)
1-2	A	4	5-6	G	4
1-3	B	1	5-7	H	8
2-4	C	1	6-8	I	1
3-4	D	1	7-8	J	2
3-5	E	6	8-10	K	5
4-9	F	5	9-10	L	7

(a) Construct PERT network.

(b) Compute T_E and T_L for each activity.

(c) Find the critical path.

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17. A TV repairman finds that the time spent on his jobs has a exponential distribution with mean 30 minutes. If he repairs TV sets in the order in which they come in, and if the arrivals follow approximately Poisson distribution with an average rate of 10 per 8 hour day, what is the repairman's expected idle time each day? How many jobs are ahead of the average with the set just brought in?

18. A manufacturer buys costing equipment from outside suppliers Rs. 30 per unit. Total annual need are 800 units. The following data is available:

    Annual Return on Investment 10%. Rent, Insurance etc. per unit per year Re. 1. Cost of placing an order Rs. 100. Determine Economic Order Quantity.

    (5 × 5 = 25 Marks)

SECTION – C

Answer **any two** of the following. Each question carries **15** marks.

19. Construct a dual for the following primal.

    Minimize $Z = 6x_1 - 4x_2 + 4x_3$

    Subject to constraints,

    $$6x_1 - 10x_2 + 4x_3 \geq 14 \qquad \text{..........(i)}$$
    $$6x_1 + 2x_2 + 6x_3 \geq 10 \qquad \text{..........(ii)}$$
    $$7x_1 - 2x_2 + 5x_3 \leq 20 \qquad \text{..........(iii)}$$
    $$x_1 - 4x_2 + 5x_3 \geq 3 \qquad \text{..........(iv)}$$
    $$4x_1 + 7x_2 - 4x_3 \geq 20 \qquad \text{..........(v)}$$
    $$\text{where } x_1, x_2, x_3 \geq 0$$

20. The cost of transportation per unit from three sources and four destinations are given in the table. Obtain the initial basic feasible solutions using the following methods.

   (a) North-west corner method

   (b) Least cost method.

Source	Destination				Supply
	1	2	3	4	
1	4	2	7	3	250
2	3	7	5	8	450
3	9	4	3	1	500
Demand	200	400	300	300	1200

21. The cost of a machine is Rs. 6,100 and its scrap value is only Rs. 100. The maintenance costs are found to be

Year :	1	2	3	4	5	6	7	8
Maintenance Cost (in Rs.) :	100	250	400	600	900	1,250	1,600	2,000

   When should the Machine be replaced?

22. What are the essential factors for the success of inventory control?

(2 × 15 = 30 Marks)