

Reg. No. :

Name :

Fourth Semester M.Com. Degree Examination, May 2020

Elective : Finance / Marketing

MANAGEMENT OPTIMISATION TECHNIQUES

**(Common for CO243F (2014 Admn to 2017 Admn)/
CO244M (2015 Admn to 2017 Admn))**

Time : 3 Hours

Max. Marks : 75

SECTION – A

Answer **all** the following questions. **Each** question carries **2** marks.

1. What is an artificial variable?
2. What is unbounded solution in LPP?
3. What is objective function?
4. What is duality in LPP?
5. What do you mean by constrained assignment problem?
6. What is two persons zero-sum game?
7. What is looping and dangling in network?
8. What are the assumptions of replacement theory?
9. What do you mean by decoupling inventories?
10. What is Markov analysis?

(10 × 2 = 20 Marks)

P.T.O.



SECTION – B

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

11. Examine the differences between assignment and transportation problem ?
12. Discuss the steps involved in solving LPP using graphic method.
13. What is meant by degeneracy in transportation problem? How is degeneracy resolved in such problem?
14. Explain the terms:
(i) Event (ii) Slack time (iii) Critical Path.
15. Customers arrive at one window drive-in bank according to poisson distribution with mean 10/hour. Service time per customer is exponential with mean 5 minutes. The space in front of the window, including that for the serviced car, can accommodate a maximum of three cars. Other cars can wait outside this space
(i) What is the probability that an arriving customer can drive directly to the space in front of the window?
(ii) How long is an arriving customer expected to wait before starting service?
16. The cost of machine is Rs. 6,100 and its scrap value is Rs.100. The maintenance costs found from experience are as follows:

Year	1	2	3	4	5	6	7	8
Maintenance cost (Rs.)	100	250	400	600	900	1,200	1,600	2,000

When should the machine be replaced?



17. A company's management and labour union are negotiating a new settlement. Each party has 4 strategies. The cost to the company for every pair of strategy choices are given below:

Union strategies	company strategies			
	I	II	III	IV
1	20	15	12	35
2	25	14	8	10
3	40	2	10	5
4	-5	4	11	0

- (i) Find the value of the game
- (ii) Find out the strategy to be adopted by both the parties.
18. The following table shows the cost/unit of shipping to distribution centres from manufacturing plants. Solve it using Vogel's approximation method.

Plant	Distribution Centres			Supply
	P	Q	R	
X	6	5	1	50
Y	3	8	7	40
Z	5	5	2	60
Demand	20	95	35	150

(5 × 5 = 25 Marks)



SECTION – C

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

19. Solve the following LP problem using simplex method.

$$\text{Max. } Z = 4X_1 + 3X_2$$

Subject to :

$$2X_1 + X_2 \leq 1000$$

$$X_1 + X_2 \leq 800$$

$$X_1 \leq 400$$

$$X_2 \leq 700$$

$$\text{and } X_1, X_2 \geq 0$$

20. A computer centre has three expert programmers. The centre wants 3 application programmes to be developed. The head of the computer centre after carefully studying the programmes to be developed, estimate the computer time in minutes required by experts for application programmes are as follows:

Programmes	Programmers		
	A	B	C
1	120	100	80
2	80	90	110
3	110	140	120

Assign the programmers to programmes in such a way that the computer time is minimum using Hungarian assignment method.

21. What is network analysis? What are its objectives? Examine the rules to be observed while preparing a network.
22. What is management science? Discuss the phases of management science. Explain briefly the models used in management science.

(2 × 15 = 30 Marks)

