MBA - DEGREE EXAMINATIONS, NOV / DEC 2023
Second Semester
Master of Business Administration
20MBT205 - BUSINESS OPTIMIZATION TECHNIQUES
(Regulations 2020)

Duration: 3 Hours   Max. Marks: 100

PART - A (10 × 2 = 20 Marks)
Answer ALL Questions

Marks,
K-Level, CO

1. Define operation research.   *2,K1,CO1*
2. What do you mean by LPP?   *2,K1,CO1*
3. Define feasible solution.   *2,K1,CO2*
4. Differentiate balanced and unbalanced transportation problem. *2,K2,CO2*
5. Define game.   *2,K1,CO3*
6. Write a short note on Johnson's algorithm.   *2,K1,CO3*
7. State the reason for maintaining inventories.   *2,K1,CO4*
8. Interpret the meaning of EBQ.   *2,K2,CO4*
9. Classify the types of Queue.   *2,K2,CO5*
10. State the types of failures.   *2,K1,CO5*

PART - B (5 × 13 = 65 Marks)
Answer ALL Questions

11. a) Maximize: $Z = 3x + 4y$ *13,K3,CO1*
        Subject to $2x + 5y \leq 60$,
        $4x + 2y \leq 40$,
        $x,y > 0$.
        Solve by Graphical Method
        (1) Plot the graph (2) Obtain the optimal solution

                            OR

    b) Conclude your understanding on the mathematical formulation of LPP. *13,K2,CO1*

12. a) How would you your understanding on balanced and unbalanced *13,K2,CO2*
        transportation problem.

    b) Consider the transportation problem shown in the table and find the *13,K3,CO2*
        initial basic feasible solution using each of the following methods and
        compare their total costs:
        (a) North west corner method

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create   **12419**

(b) Least cost cell method

(c) Vogel's approximation method:

Market						
Plant	1	2	3	4	5	Supply
1	10	2	16	14	10	300
2	6	18	12	13	16	500
3	8	4	14	12	10	825
4	14	22	20	8	18	375
Demand	350	400	250	150	400	

13. a) How would you make use of the concept of game theory in managerial decision making? Discuss in detail. *13,K2,CO3*

OR

b) Point out the ranges of value p and q which will render the entry (2, 3) a saddle point for the game. *13,K3,CO3*

	B1	B2	B3
A1	2	4	5
A2	10	7	q
A3	4	p	6

14. a) Alpha industry needs 5400 units per year of a bought-out component which will be used in its main product. The ordering cost is Rs.250 per order and the carrying cost per unit per year is Rs.30. *13,K3,CO4*
(i) Obtain the Economic order quantity (EOQ).
(ii) Find the number of orders per year?
(iii) Find the frequency of orders?

OR

b) Explain the deterministic Inventory model with examples. *13,K4,CO4*

15. a) Discuss the characteristics of a Queueing model. *13,K2,CO5*

OR

b) In a Public telephone booth the arrivals are on the Average 15 per hour. A call on the average takes 3 minutes .If there is just one phone, find expected number of callers in the booth at any time and the proportion of the time the booth is expected to be idle? *13,K3,CO5*

PART - C (1 × 15 = 15 Marks)
(Compulsory)

16. a) A manufacturer offered two machines A and B. A has cost price of Rs.2,500, its running cost is Rs. 400 for each of first years and increased by Rs. 100 every subsequent year, Taking money's value as 10% per year, when machine should be replaced? *15,K3,CO5*

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create **12419**