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MS-51

MANAGEMENT PROGRAMME
(MP)
Term-End Examination
December, 2022
MS-51 : OPERATIONS RESEARCH

Time : 3 Hours *Maximum Marks : 100*

Note : *(i) Attempt any **five** questions.*

(ii) All questions carry equal marks.

1. Solve the following equation graphically :

Maximize :

$$Z = 2A + 3B$$

Subject to :

$$100A + 200B \leq 4000$$

$$A + B \leq 30$$

$$A \leq 26$$

$$B \leq 15$$

$$A, B \geq 0.$$

Find the maximum value.

2. Consider the transportation problem in the following table :

Origin	Destination				
	1	2	3	4	a_i
1	20	22	17	4	120
2	24	37	9	7	70
3	32	37	20	15	50
b_j	60	40	30	110	240

Find an initial basic feasible solution of the transportation problem by using "Vogel's Approximation Method."

3. What do you understand by dynamic programming ? In what areas of management can it be applied successfully ?

4. A factory follows an economic order quantity system for maintaining stocks of one of its component requirements. The annual demand is 24000 units, the cost of placing an order is ` 300 and the component cost is ` 60 per unit. The factory has imputed 24% as inventory carrying rate. Find the optimal interval for placing orders, assuming a year is equivalent to 360 days.

5. Consider the game of matching coins. Two players A and B, each put down a coin. If coins match i.e., both are head or both are tails, A gets rewarded otherwise B. However, matching on heads gives a double premium. Obtain the best strategies for both players and the value of the game.

6. The daily demand of an item is normally distributed with a mean of 50 units and standard deviation of 5 units. Lead time is 6 days. The cost of placing an order is ` 8 and the annual holding costs are 20% of the unit price of ` 1.20. A 95% service level is desired. Bank orders are allowed but there is no stock-out cost. Find the various levels. (The tabulated value of test statistic is 1.645).

7. Write short notes on any *three* of the following :
   (a) Random variable
   (b) Linear Programming
   (c) Separable Programming
   (d) Characteristics of a queuing model
   (e) Steps in simulation process