

THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)***MBA DEGREE END SEMESTER THEORY EXAMINATIONS, NOV/DEC 2025***Second Semester**Master of Business Administration***BA4201 / PMBT2421 – Quantitative Techniques for Decision Making***Regulations – 2021 & 2024**Duration : 3 Hrs**Maximum: 100 Marks***PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)**

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
1.	Define Linear Programming.	L1	1	2
2.	What is Sensitivity analysis?	L1	1	2
3.	Summarize Stepping stone method.	L2	2	2
4.	Outline Degeneracy.	L2	2	2
5.	Classify methods of matrices.	L2	3	2
6.	What is Saddle Point?	L1	3	2
7.	What are EOQ and EBQ?	L1	4	2
8.	Outline how replacement models associate with time value of money.	L2	4	2
9.	Summarize infinite calling source.	L2	5	2
10.	What is the use of random numbers?	L1	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
11.	a i Use dual simplex method to solve the following LPP $Minimize Z = x_1 + x_2$ Subject to: $2x_1 + x_2 \geq 4$ $x_1 + 7x_2 \geq 7$ and $x_1, x_2 \geq 0$.	L2	1	8
	ii Explain the relevance of Quantitative techniques in Management decision making. Give Examples.	L2	1	8
	Or			
b i	Explain the common terminologies used in Linear Programming.	L2	1	8
	ii Maximize $50x_1 + 60x_2$ Subject to: $2x_1 + x_2 \leq 300$ $3x_1 + 4x_2 \leq 509$ $4x_1 + 7x_2 \leq 812$ and $x_1, x_2 \geq 0$.	L2	1	8

12. a i Make use of Balanced and Unbalanced problems and explain. Give example. L3 2 8
- ii Summarize Transshipment models with example. L2 2 8

Or

- b A company has a team of four salesmen A, B, C and D and there are four districts 1,2,3 and 4 where the company wants to start its business. After taking into account the capabilities of salesmen and the nature of districts, the company estimates that the profit per day in rupees for each salesman in each district is as below:

	1	2	3	4
A	16	10	14	11
B	14	11	15	15
C	15	15	13	12
D	13	12	14	15

Find the assignment of salesmen to various districts which will yield a maximum profit?

13. a Solve the Payoff Matrix: L2 3 16

		Player B				
		I	II	III	IV	V
I		-2	0	0	5	3
II		3	2	1	2	2
III		-4	-3	0	-2	6
IV		5	3	-4	2	-6

Or

- b Solve the below problem using dominance rule: L2 3 16

	B1	B2	B3	B4
A1	3	2	4	0
A2	3	4	2	4
A3	4	2	4	0
A4	0	4	0	8

14. a Consider the following data. Unit cost: Rs.100, Order cost:Rs.160, Inventory Carrying cost: Rs.20, Back order cost (due to stock out cost): Rs.10 and Annual demand 1000 units. Compute the following: L2 4 16
- (i) Optimum Order Quantity
- (ii) Time between order
- (iii) Maximum quantity of backorders
- (iv) Inventory level
- (v) Overall annual cost.

Or

- b A firm is considering replacement of a machine, whose cost price is Rs.12200 and the scrap value is Rs.200. The running (maintenance and operating) cost are found from experience are as follows: L2 4 16

Year	1	2	3	4	5	6	7	8
Running cost	200	500	800	1200	1800	2500	3200	4000

When should the machine be replaced? Explain it with the calculation table.

15. a The following table gives the arrival pattern at a coffee counter for one minute intervals. The service is taken as 2 persons in one minute in one counter: L2 5 16

No. of persons arriving	0	1	2	3	4	5	6	7
Probability percentage	5	10	15	30	20	10	5	5

Using Monte- Carlo simulation technique and the following random numbers, generate the pattern of arrivals and the queue formed when the following 20 random numbers are given: 5, 25, 16, 80, 35, 48, 67, 79, 90, 92, 9, 14, 1, 55, 20, 71, 30, 42, 60, 85. Find the queue length if two counters are used. (i.e 4 persons in one minute)

Or

- b The automobile company manufactures around 150 scooters. The daily production varies from 146 to 154 depending upon the availability of raw materials and other working conditions: L3 5 16

Production	146	147	148	149	150	151	152	153	154
Probability	0.04	0.09	0.12	0.14	0.11	0.10	0.20	0.12	0.08

The finished scooters are transported in a specially arranged lorry accommodating 150 scooters.

Using following random numbers

80, 81, 76, 75, 64, 43, 18, 26, 10, 12, 65, 68, 69, 61, 57

Simulate the process to find out:

1. What will be the average number scooters waiting in the factory?
2. What will be the average number of empty spaces on the lorry?