PRN:		Course Code:	P73PC104

First Year **MBA** End Semester Examination Winter 2024 000477

Decision Science

Day and Date: Fri 06 DEC 2024 Max Marks: **50**

Time : 10:30AM To 12:30PM Duration: **02** hrs

Instructions: All questions are compulsory.

		Marks	Bloom's Level	CO
Q.1	**Attempt the following**			
a)	Describe the importance of Quantitative Techniques in business decision making.	05	L2	CO1
b)	Elaborate frequency polygon and frequency curves with suitable examples	05	L3	CO1
Q.2	**Attempt any two from the following**			
a)	Find the feasible transportation routes using LCM method.	05	L3	CO3

	A	B	C	D	Supply
I	19	30	50	10	7
II	70	30	40	60	9
III	40	8	70	20	18
Demand	5	8	7	14	

b)	A Company sells two different products A and B, making a profit of Rs 60 and Rs 50 per unit, respectively. They are both produced with help of a common production process and are sold in two different markets. The production process has a total capacity of 50,000 man-hours. It takes 4 hours to produce a unit of A and 2 hour to produce a unit of B. The market has been surveyed and company official feel that the maximum number of units of A that can be sold is 10000 units and that of B is 15000 units. Subject to these limitations, products can be sold in any combination. Formulate this problem as LPP Model to maximize profit.	05	L3	CO3

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c) Assign the programmers to the programs in such a way that the total computer time is minimum.Programmers 05 L3 CO3

Programs	A	B	C
1	60	50	40
2	40	45	55
3	55	70	60

Q.3 **Attempt any two from the following**

a) The following matrix gives the payoff (in Rs) of different strategies (alternatives) *S*1, *S*2 and *S*3 against conditions (events) *N*1, *N*2,*N*3 and *N*4. 05 L3 CO4

Strategy	State of Nature			
	N1	N2	N3	N4
S1	4000	-100	6000	18000
S2	20000	5000	400	0
S3	20000	15000	-2000	1000

Indicate the decision taken under the following approaches:

(i) Pessimistic (ii) Optimistic

b) The tools in a factory are issued at tool crib, The service time for the receipt is distributed exponentially with a mean of 4 minutes per workman. If workers arrive singly and at random with an average rate of 20 workers per 100 minutes. Determine average number of workers waiting at the tool crib, average waiting time in queue, percentage time the crib clerk is idle? 05 L3 CO4

c) Six jobs go first over machine I and then over machine II. The order of the completion of jobs has no significance. The table shows the machine times in hours for six jobs and the two machines. 05 L4 CO4

Job	**1**	**2**	**3**	**4**	**5**	**6**
Machine I	**2**	**4**	**9**	**6**	**7**	**4**
Machine II	**6**	**7**	**4**	**3**	**3**	**11**

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Q.4 **Attempt any two from the following**

a)	Elaborate in detail the requisite of good statistical average	05	L4	CO2
b)	Maximize Z= 40x + 80y, Subject to , $2x + 3y \leq 48$, $x \leq 15$, $y \leq 10$ and $x, y \geq 0$ Solve using graphical method.	05 08	L3 L4	CO3 CO1
c)	Explain with suitable examples Measures of Dispersion including Range, Quartile Deviations, Mean Deviation, Standard Deviation.	05	L4	CO2

Q.5 **Attempt any Two of the following**

a)	An engineering firm uses reorder level system to replenish stock. The past records of weekly demand of a certain item costing have the following distribution.	05	L3	CO5

Demand per day	Frequency
0	4
1	10
2	15
3	39
4	22
5	10

When an order is placed to replenish stock, there is delivery time lag which follows the following distribution

Lead Time	Frquency
1	24
2	12
3	4

Using the following random numbers obtain reorder level.

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b) Assign the programmers to the programs in such a way that the total computer time is minimum. 05 L4 CO5

Programmers

Programs	A	B	C
1	60	50	40
2	40	45	55
3	55	70	60

c) Discuss with suitable examples Forecasting Techniques: Time Series Analysis, Moving Averages, and Exponential Smoothing. 05 L4 CO5

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