Printed page: 4 **Subject Code: CMBA0102**

Roll No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

MBA

SEM: I - THEORY EXAMINATION (2025-2026)

Subject Business Statistics & Quantitative Techniques for Managers

Time: 3 Hours **Max. Marks:100**

General Instructions:

IMP: Verify that you have received question paper with correct course, code, branch etc.

1. *This Question paper comprises of three Sections -A, B, & C. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.*
2. *Maximum marks for each question are indicated on right hand side of each question.*
3. *Illustrate your answers with neat sketches wherever necessary.*
4. *Assume suitable data if necessary.*
5. *Preferably, write the answers in sequential order.*
6. *No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.*

SECTION – A 20

1. Attempt all parts:-

1-a. The median of the following data : 8, 9, 12, 18, (x+2), (x+40), 30, 31, 34, 39 is 24 . The value of x is (CO1, K2) 1

(a) 22

(b) 23

(c) 24

(d) 3

1-b. Identify the following is a characteristic of a mean. (CO1, K1) 1

(a) The sum of deviations from the mean is zero

(b) It minimises the sum of squared deviations

(c) It is affected by extreme scores

(d) All of the above

1-c. The values of the correlation coefficient indicates a perfect negative correlation. (CO2, K1) 1

(a) +1

(b) -1

(c) 0

(d) 0.5

1-d. If two regression coefficients have the same algebraic signs, the correlation coefficient r will be; (CO2, K1) 1

(a) Positive

(b) Negative

(c) Zero

(d) None of these

1-e. A number is chosen randomly from numbers 1 to 60. The probability that the chosen number is a multiple of 5 is : (CO3, K2) 1

(a) 1/5

(b) 3/5

(c) 7/10

(d) 9/10

1-f. A die is thrown once. The probability of getting an even number : (CO3, K2) 1

(a) 1/2

(b) 1/3

(c) 2/3

(d) 1/5

1-g. The term "Operations Research" was coined during in historical period: (CO4, K1) 1

(a) World War I
(b) World War II
(c) Cold war
(d) None Of these

1-h. The term Operations Research introduced by: (CO4, K1) 1

(a) J.F. McCloskey
(b) F.N. Trefethen
(c) P.F. Adams
(d) Both A and B

1-i. When the total number of allocations in a basic feasible solution of an $m \times n$ transportation problem is not equal to $m+n-1$, the situation is known as: (CO5, K1) 1

(a) Degeneracy

(b) Unbalanced situation

(c) Tie situation

(d) None of these

1-j. Identify the following methods is used to verify the optimality of the current solution of the transportation problem. (CO5, K1) 1

(a) Least cost method

(b) Modi Method

(c) Vogel's Approximation Method

(d) All of the above

2. Attempt all parts:-

2.a. The Interquartile Range for the data set - 2, 3, 5, 7, 11, 13, 17, 19, 23,29 (CO1, K1) 2

2.b. Describe the term Regression with examples (CO2 ,K2) 2

2.c. In a class of 10 students, 4 are boys and the rest are girls. Find the probability that a student selected will be a girl .(CO3 ,K2) 2

2.d. Define slack and surplus variable (CO4, K1) 2

2.e. Define balanced Transportation Problem. (CO5, K1) 2

SECTION – B 30

3. Attempt all parts:-

3.a. Answer any <u>one</u> of the following-

3-a.i Calculate Q. D. & Coefficient Q. D. of following data: (CO1 ,K3) 6

Tax(Rs.)	25	50	75	100	200	300
No. of Traders	135	120	90	60	55	40

3-a.ii Calculate Mode of the given data: (CO1 , K3) 6

C.I.	100-200	200-300	300-400	400-500	500-600	600-700	700-800	800-900
f	3	11	24	58	40	25	16	7

3.b. Answer any <u>one</u> of the following-

3-b.i Find the coefficient of rank correlation of given data: (CO2 , K3) 6

x	80	91	99	71	61	81	70	59
y	123	135	154	110	105	134	121	106

3-b.ii Give the difference between coefficient of correlation and regression. (CO2, K2) 6

3.c. Answer any <u>one</u> of the following-

3-c.i State and Prove Bayes theorem in Probability (CO3, K2) 6

3-c.ii Calculate the probability that a leap year selected at random will contain either 53 Sunday or 53 Monday. (CO3 , K3) 6

3.d. Answer any <u>one</u> of the following-

3-d.i Discuss the limitations of Operation Research. (CO4 ,K2) 6

3-d.ii Write the dual of given LPP: (CO4, K3) 6

Max. $Z=x_1-x_2+3x_3$

Subject to

$x_1+x_2+x_3 \leq 10$

$2x_1-x_3 \leq 2$

$2x_1-2x_2+3x_3 \leq 6$

$x_1, x_2, x_3 \geq 0$

3.e. Answer any <u>one</u> of the following-

3-e.i Write the working rule of Vogel's approximation method in TransportationProblem.(CO5 , K2) 6

3-e.ii Solve the given assignment problem: (CO5 , K3) 6

	I	II	III	IV
A	8	26	17	11
B	13	28	4	26
C	38	19	18	15
D	19	26	24	10

SECTION – C 50

4. Answer any <u>one</u> of the following-

4-a. Find mean and median of the given data; (CO1, K3) 10

C.I.	0-10	10-20	20-30	30-40	40-50
f	25	15	15	5	15

4-b. Find Standard deviation of given data; (CO1 ,K3) 10

Size	0-10	10-20	20-30	30-40	40-50	50-60	60-70
f	7	12	18	25	16	14	8

5. Answer any <u>one</u> of the following-

5-a. Compute the regression equations of X on Y and Yon X of the data: (CO2 , K3) 10

X	14	13	11	10	9	8	7
Y	3	8	20	35	40	44	50

5-b. Define correlation . Explain various types of correlation with suitable examples. (CO2 , K2) 10

6. Answer any <u>one</u> of the following-

6-a. A random variable X has the following probability distribution; (CO3 , K3) 10

X	-2	-1	0	1	2	3
P(X)	0.1	K	0.2	2K	0.2	K

i) Find the value of K

ii) Find the expected value and variance of X

6-b. Differentiate between P.M.F and P.D.F. with examples. (CO3 ,K2) 10

7. Answer any <u>one</u> of the following-

7-a. Explain the models of Operation Research with examples. (CO4, K2) 10

7-b. Solve the LPP by graphical method; (CO4, K3) 10

Min. Z=20x+10y

Subject to

$x+2y \leq 40$

$3x+ y \geq 30$

$4x+3y \geq 60$

$x, y \geq 0$

8. Answer any <u>one</u> of the following-

8-a. Discuss the utility of transportation problems in business decision making.: (CO5, K2) 10

8-b. Solve the maximal assignment problem: (CO5, K3) 10

	A	B	C	D	E
1	5	11	10	12	4
2	2	4	6	3	5
3	3	12	5	14	6
4	6	14	4	11	7
5	7	9	8	12	5