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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)

MBA-IEV

SEM: I - THEORY EXAMINATION (2025 - 2026)

Subject: Business Statistics and Quantitative Techniques

Time: 3 Hours

Max. Marks: 100

General Instructions:

IMP: Verify that you have received the question paper with the 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. In order to compare two or more frequency distribution, the best measure is the coefficient of (CO1,K1) 1

(a) Variation

(b) Range

(c) Quartile

(d) Mean- Deviation

1-b. Median for 12, 13, 51, 16, 8, 9, 10, 20 is (CO1,K2) 1

(a) 12 (b) 12.5 (c) 13 (d) None of these

1-c. If both the regression coefficients are positive then coefficient of correlation will be (CO2,K1) 1

(a) Negative

(b) Positive

(c) Always negative

(d) None of these

1-d. Karl Pearson's correlation coefficient is (CO2, K1) 1

(a) Independent of change of origin but not scale

(b) Independent of change of scale but not origin

(c) Independent of change of origin and scale

(d) Dependent of change of origin and scale

1-e. If A & B are two events such that $P(A) = 0.4$ and $P(B) = 0.1$ and $P(A \cap B) = 0.2$. Then $P(A \cup B)$ is equal to: (CO3,K2) 1

(a) 0.3 (b) 0.5 (c) 1.0 (d) None of these

- 1-f. The probability of getting a total of 10 in a single throw of two dice is: (CO3,K2) 1
 (a) 1/9 (b) 1/12 (c) 1/6 (d) None of these
- 1-g. The success of Operations Research mainly depends on the formulation of(CO4,K1) 1
 (a) Behavioural models
 (b) Mathematical model
 (c) Iconic models
 (d) Conceptual models
- 1-h. Coefficient of slack variables in objective function is(CO4,K1) 1
 (a) 0 (b) 1 (c) -1 (d) 2
- 1-i. The Least Cost Method is also known as (CO5,K1) 1
 (a) Matrix Minima
 (b) Hungarian
 (c) Simplex
 (d) Johnson
- 1-j. The property of a feasible solution in an assignment problem (CO5,K1) 1
 (a) Each agent is assigned to only one task
 (b) Each task is assigned to multiple agents
 (c) Some agents are left unassigned
 (d) Some tasks are left unassigned
2. Attempt all parts:-
- 2.a. Sum of squares of items 2430, mean is 7, N=12, find the coefficient of variation.(CO1,K2) 2
- 2.b. Write the limitation of regression.(CO2,K2) 2
- 2.c. Define simple event in probability theory with example. (CO3,K1) 2
- 2.d. Discuss Optimization in O.R. (CO4,K2) 2
- 2.e. List any three approaches used with transportation problem for determining the starting solution. (CO5,K1) 2

SECTION-B

3. Attempt all parts:- 30
- 3.a. Answer any one of the following:-
- 3.a.(i) Calculate the mean deviation from mean for the following data: (CO1,K3) 6

Class Interval	2-4	4-6	6-8	8-10
frequency	3	4	2	1

- 3.a.(ii) Describe the advantages and disadvantages of mean, median and mode. (CO1,K2) 6
- 3.b. Answer any one of the following:-
- 3.b.(i) Write the properties of coefficient of correlation (CO2,K2) 6
- 3.b.(ii) The information about Sales turnover and advertising expenses given below: 6

	Mean	S.D
Advertisement Expenditure (Rs lacs)	10	3
Sales turnover (Rs crores)	90	12
Coefficient of correlation	0.8	

Find:

a. Two regression equations.

b. Estimate likely sales turnover when the advertisement budget is Rs 15 lacs (CO2, K3)

3.c. Answer any one of the following:-

3.c.(i) Define probability mass function and probability density function. Explain by means of two examples. (CO3, K2) 6

3.c.(ii) Obtain the probability that a leap year selected at random will contain 53 Wednesday or 53 Thursday. (CO3, K3) 6

3.d. Answer any one of the following:-

3.d.(i) Find the dual of the following LPP: (CO4, K3) 6

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

$$\text{subject to, } 4x_1 - x_2 \leq 8$$

$$8x_1 + x_2 + 3x_3 \geq 12$$

$$5x_1 - 6x_3 \leq 13$$

$$x_1, x_2, x_3 \geq 0$$

3.d.(ii) Give the main characteristics of Operations Research. (CO4, K2) 6

3.e. Answer any one of the following:-

3.e.(i) Obtain an initial basic feasible solution to the following transportation problem by using NWCR method. (CO5, K3) 6

	A	B	D	Demand
I	9	8	5	25
II	6	8	4	35
III	7	6	9	40
Supply	30	25	40	

3.e.(ii) Differentiate between assignment problem and transportation problem. (CO5, K3) 6

SECTION-C

50

4. Answer any one of the following:-

4-a. List down the measures of dispersion. The weight of coffee in 70 jars is shown in the following table: - 10

Weight (in grams)	200-201	201-202	202-203	203-204	204-205	205-206
Frequency	13	27	18	10	1	1

Determine the Range and quartile deviation of the above distribution. (CO1, K3)

4-b. Define kurtosis. Calculate coefficient of kurtosis from the table given below: (CO1, K3) 10

Variable	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	10	40	20	0	10	40	16	14

5. Answer any one of the following:-

5-a. Compute the equations of the regression line for the given data: (CO2, K3) 10

X	2	4	5	6	8	11
Y	18	12	10	8	7	5

5-b. Calculate Rank Correlation coefficient of the given data and interpret the result: (CO2, K3) 10

X	49	69	39	49	29
Y	59	59	59	49	39

6. Answer any one of the following:-

6-a. Find expectation and variance of the given probability distribution(CO3, K3): 10

X	-1	0	4	5	6
P(X)	1/9	2/9	3/9	1/9	2/9

6-b. A doctor is to visit a patient. From the past experience, it is known that the probabilities that he will come by train, bus, scooter or by other means of transport are respectively $\frac{3}{10}, \frac{1}{5}, \frac{1}{10}, \frac{2}{5}$. The probabilities that he will be late are $\frac{1}{4}, \frac{1}{3}, \frac{1}{12}$ and if he comes by train, bus and scooter respectively, but if he comes by other means of transport, then he will not be late. When he arrives, he is late. Calculate the probability that he comes by train. (CO3,K3) 10

7. Answer any one of the following:-

7-a. A manufacturer produces two types of models M and N. Each model of the type M requires 3 hrs of grinding and 4 hrs of polishing; whereas each model of the type N requires 3 hrs of grinding and 6 hrs of polishing. The manufacturer has 2 grinders and 3 polishers. Each grinder works 50 hrs in a week and each polisher works 70 hours in a week. Profit on M model is 2 rs. and on N model is rs. 3. Whatever is produced in a week is sold in the market. Find the maximum profit. Solve graphically to get the optimal solution. (CO4,K3) 10

7-b. Define OR. Explain the scope of OR in various fields. (CO4,K2) 10

8. Answer any one of the following:-

8-a. Find the assignment of salesmen to various districts which will yield maximum profit. (CO5, K3) 10

		Districts			
		I	II	III	IV
Salesman	A	8	26	17	11
	B	13	28	4	26
	C	38	19	18	15
	D	19	16	24	10

8-b. Find initial basic feasible solution by using Least Cost method of the following transportation problem.(CO5,K3) 10

	X	Y	Z	Capacity
A	8	7	3	60
B	3	8	9	70
C	11	3	5	80
DEMAND	50	80	80	210