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

BBA

SEM: I - THEORY EXAMINATION (2025 - 2026)

Subject: BUSINESS STATISTICS

Time: 2.5 Hours

Max. Marks: 60

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

15

1. Attempt all parts:-

- 1-a. If A is a 5×5 matrix and $|A|=4$, value of $|6A|$ is: (CO1, K2) 1
- (a) 5
- (b) 0
- (c) 24
- (d) 6
- 1-b. Consisting of all the items or individuals under consideration in a statistical study is (CO2, K1) 1
- (a) Population
- (b) Sample
- (c) Data
- (d) Event
- 1-c. If the Variance of the any series is $\text{Var}(X)$ and each observation is multiplied by a, then the Variance of the new series (CO3, K1) 1
- (a) $\text{Var}(X)$
- (b) $a^2 \text{Var}(X)$
- (c) $a \text{Var}(X)$
- (d) $a^3 \text{Var}(X)$
- 1-d. In a deck of 52 cards, the probability of drawing a King is: (CO4, K2) 1
- (a) $1/13$
- (b) $1/4$
- (c) $1/52$

(d) 4/13

1-e. In business decision-making, time series analysis is used for: (CO5, K1) 1

- (a) Short-term predictions only
- (b) Long-term predictions only
- (c) Forecasting sales, demand, and trends
- (d) Analysing unrelated data

2. Attempt all parts:-

2.a. If $A = \begin{bmatrix} 4 & -3 \\ 2 & -7 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & 2 \\ -5 & 6 \end{bmatrix}$, then find $2A+7B$. (CO1, K3) 2

2.b. Describe the purpose of data presentation. (CO2, K2) 2

2.c. The coefficient of variation is 58%. The standard deviation is 21.1. Calculate the arithmetic mean. (CO3, K2) 2

2.d. A dice is rolled once. Calculate the probability of getting a number less than 3. (CO4, K2) 2

2.e. Discuss limitations of Least Square method. (CO5, K2) 2

SECTION-B 15

3. Answer any three of the following:-

3-a. Obtain the cofactor of the matrix $A = \begin{bmatrix} 3 & 5 & 2 \\ -1 & 2 & 7 \\ 4 & 6 & -2 \end{bmatrix}$. (CO1, K3) 5

3-b. Explain the different methods of data collection in statistics.(CO2, K2) 5

3.c. Calculate the mean by using short-cut method for the given dataset: (CO3,K3) 5

X	1	2	3	4	5	6	7	8	9
f	1	6	10	25	12	20	8	5	7

3.d. Two cards are drawn from a pack of 52 cards without replacement. Compute the probability that both cards are aces. (CO4, K3) 5

3.e. Calculate quantity index using the fixed base (simple aggregate) method is: (CO5, K3) 5

Commodity:	X	Y	Z
Base year Quantities:	100	200	150
Current year Quantities:	120	220	180

SECTION-C 30

4. Answer any one of the following:-

4-a. Show that for any square matrix A, $A+A^T$ is symmetric and $A-A^T$ is skew-symmetric.(CO1, K3) 6

4-b. If $A = \begin{bmatrix} 2 & 4 \\ 5 & 8 \end{bmatrix}$ and $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, then calculate the term $A^3 + 3A - 4I$. (CO1, K3) 6

5. Answer any one of the following:-

- 5-a. Discuss the importance and limitations of statistics. (CO2, K2) 6
- 5-b. Draw bar diagram for the following data : (CO2, K3) 6

Seed yield	0-10	10-20	20-30	30-40	40-50
No. of plants	4	6	10	26	24

6. Answer any one of the following:-

- 6-a. Calculate standard deviation of the following data. (CO3, K3) 6

Age in years	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20
Student	30	40	50	60	40	30	20	10

- 6-b. Define central tendency. Describe the methods of measuring the central tendency. (CO3, K2) 6

7. Answer any one of the following:-

- 7-a. A fair coin is tossed four times. Obtain the probability of getting: 6
 (a) Exactly three heads.
 (b) At least two heads. (CO4, K3)

- 7-b. Let two events A and B be such that $P(A)=0.5$, $P(B)=0.6$, and $P(A \cap B)=0.2$. (CO4, K3) 6
 (a) Find $P(A \cup B)$.
 (b) Verify the relationship $P(A \cup B)=P(A)+P(B)-P(A \cap B)$.

8. Answer any one of the following:-

- 8-a. Given the following data, fit an exponential trend equation and forecast for 2023: (CO5, K3) 6

Year:	2018	2019	2020	2021	2022
Revenue:	10	15	25	40	60

- 8-b. Calculate a Quantity Index using the Fisher Ideal method for the following data: (CO5, K3) 6

Base year Quantities and Prices	50,10	80,15	100,20
Current year Quantities and Prices	60,12	90,18	110,22