Printed Page:- 04 Subject Code:- AMIBA0301

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

MBA (Integrated)

SEM: III - THEORY EXAMINATION (2024 - 2025)

Subject: Advanced 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. First quartile is also called… (CO1, K1) 1

(a) Standard Deviation

(b) Median

(c) Lower quartile

(d) None of the above

1-b. Parabolic trend equation is also called.... (CO2, K2) 1

(a) Quadratic trend equation

(b) Cubic trend equation

(c) cyclical equation

(d) Linear trend equation

1-c. Four persons are chosen at random from a group containing 3 men, 2 women and 4 children then the probability that exactly two of them will be children ... (CO3, K2) 1

(a) 9/21

(b) 10/21

(c) 6/21

(d) None of these

1-d. The efficiency of an estimator is measured by (CO4, K1) 1

(a) Consistency

(b) Bias
(c) Variance
(d) None of these

1-e. The aggregate index formula using base period quantities is known as (CO5, K1) 1

(a) Laspeyre's index
(b) Fisher's ideal index
(c) Bowley's index
(d) Paasche's index

2. Attempt all parts:-

2.a. Calculate the first quartile and third quartile of the given series:25, 55, 5, 45, 15, 35 (CO1, K2) 2

2.b. Write normal equations of $y = a + b x + cx^2$, total number of observation = n (CO2, K1) 2

2.c. In a class of 10 students, 4 are boys and the rest are girls. Find the Probability (i) a student selected will be a girl. (ii) either a girl or a boy. (CO3, K1) 2

2.d. Find the expected frequencies of 2 x 2 contingency table given below: (CO4, K1) 2

2	10
6	6

2.e. Write down the formula for calculating Fisher's price and quantity index number.(CO5, K2) 2

SECTION-B 15

3. Answer any three of the following:-

3-a. Calculate Mean deviation from mean from the following data: (CO1, K3) 5

x	20	30	40	50	60	70
f	8	12	20	10	6	4

3-b. Fit a straight line to the data given below: (CO2, K2) 5

x	1	2	3	4	5
y	2	4	6	8	10

3.c. There are three bags. Bag I contains 3 white and 5 black balls. Bag II has 5 white and 7 black balls while bag III contains 9 white and 6 black balls. One white ball is drawn from one of the bags. Find the probability that it is drawn from bag II? (CO3, K3) 5

3.d. Define estimation and explain all the properties of a estimator. (CO4, K3) 5

3.e. "Index numbers are Economic Barometers" . Explain this statement (CO5, K3) 5

SECTION-C 30

4. Answer any one of the following:-

4-a. Calculate the Coefficient of Variation if goals scored by two teams A & B in a football session were as follows: 6

No. of Goals Scored	0	1	2	3	4
No. of Matches by team A	27	9	8	5	4
No. of Matches by team B	17	9	5	6	3

Suggest which team is more consistence in their performance. (CO1, K3)

4-b. Find measure of skewness and kurtosis on the basis of moments for the following distribution : (CO1, K3) 6

Marks	5-15	15-25	25-35	35-45	45-55
No. of students	1	3	5	7	4

5. Answer any one of the following:-

5-a. Fit a straight-line trend for the following data of a company by the method of least squares : (CO2, K3) 6

Year	2000	2001	2002	2003	2004
Sales (Rs lakhs)	40	80	120	200	160

5-b. What is time series? Explain the various components of time series. (CO2) 6

6. Answer any one of the following:-

6-a. If A and B are mutually exclusive events, P(A) = 0.35 and P(B) = 0.45, then find (i) P (A') (ii) P (B') (iii) P (A U B) (iv) P (A ⋂ B) (v) P (A' ⋂ B') (vi) P (A ⋂ B'(CO3, K2) 6

6-b. A machine fills coffee powder in pouches, with an average of 200 gm and a standard deviation of 4 gm. Assuming that the coffee weight is normally distributed. Find the probability that a coffee pouch selected at random will contain the following quantity of a coffee: 6
(i) At least 200 gm.
(ii) Between 200 to 206 gm.
Given: Area between (z = 0) to (z =1.5) = 0.4332. (CO3, K3)

7. Answer any one of the following:-

7-a. To test the effectiveness of inoculation against cholera, the following table was obtained: 6

	Attacked	Not Attacked
Inoculated	30	160
Not inoculated	140	460

The figure represent the number of persons. Use chi-square test to defend or refute the statement that inoculation prevents attack from cholera

Tabulated value of chi-square at 5% LOS is 3.84. (CO4, K3)

7-b. Imagine a study comparing the performance of three different fitness programs (Program X, Program Y, and Program Z) in terms of weight loss (in pounds) over eight weeks. Here are the weight loss results for participants: 6

Program X	Program Y	Program Z
10	15	8
12	14	9
9	16	7
11	15	10
10	17	8

Conduct a one-way ANOVA to determine if there are significant differences in weight loss among the three fitness programs.The tabular value of F at 5 % level of significance is 3.89.(CO4, K3)

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

8-a. Define an index number.Explain the utility of the index number.(CO5, K3) 6

8-b. Compute the Laspeyre's and Paasche's index number from the following data:(CO5, K3) 6

Item	1998		1999	
	Price	Quantity	Price	Quantity
A	5	25	6	30
B	3	8	4	10
C	2	10	3	8
D	10	4	3	5