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Printed Page:-4 **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 (2025 - 2026)
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. To convert annual linear trend equation into monthly trend equation(CO2,K1) 1

(a) a is divided by 12 and b is divided by 144
(b) a is divided by 10 and b is divided by 100
(c) a is divided by 12 and b is divided by 100
(d) a is divided by 4 and b is divided by 4

1-c. The probability of an impossible event is: (CO3,K1) 1

(a) 0
(b) 1
(c) Not defined
(d) Insufficient data

1-d. An estimator in statistics is. (CO4,K1) 1

(a) measure of the accuracy of a sample
(b) A statistical method for data collection
(c) A statistic used to estimate a population parameter
(d) A measure of variability in a dataset

1-e. Select one is not used to find simple or unweighted index number(CO5,K1) 1

(a) Simple Aggregative Method
(b) Simple Average of price relatives Method
(c) Fisher's Method
(d) None of these

2. Attempt all parts:-

2.a. The coefficient of variation is 58%. The standard deviation is 21.1. what is the arithmetic mean? (CO1,K2) 2

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

2.c. State Addition theorem of probability. (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 method of index number.(CO5,K1) 2

SECTION-B 15

3. Answer any three of the following:-

3-a. Find quartile deviation of the given data: 46, 50, 38, 43, 60, 69, 65, 58 (CO1,K3) 5

3-b. With what components of the time series will you associate the following events:(CO2,K2) 5

a. Sales of textile firm during Deepawali
b. An era of prosperity in economy
c. Increase in sales of ice-cream in summer
d. Decline of sales of cold drink in winter
e. Outbreak of Corona in the year 2020

3.c. State and proof Bayes' theorem. (CO3,K2) 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 mean deviation from mean of the given data: (CO1, K3) 6

Class interval	100-150	150-200	200-250	250-300	300-350
Frequency	3	8	21	6	2

4-b. Calculate standard deviation of the following frequency distribution:(CO1, K3) 6

C.I.	0-10	10-20	20-30	30-40	40-50	50-60

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f	11	29	18	4	5	3

5. Answer any one of the following:-

5-a. Give the concept of time series. Explain the various components of time series.(CO2, K2) 6

5-b. Fit a straight-line trend by method of least square for the following data. Find the sale for the year 2020. (CO2, K3) 6

Year	2015	2016	2017	2018	2019
Sale	14	15	18	11	14

6. Answer any one of the following:-

6-a. In bolt factory, Machines A, B and C manufacture respectively 25%,35% and 40% of the total. Of their output 5, 4 and 2 percent are defective bolts. A bolt is drawn at random from the product and is found to be defective. Find the probability that it was manufactured by machine B. (CO3,K3) 6

6-b. A random variable has the following probability mass function: 6

X.	0.	1.	2.	3.	4.	5.	6.	7.
P(X)	0	k	2k	2k	3k	k^2	$2k^2$	$7k^2+k$

Calculate the following:

1. k
2. P(X<6)
3. P(X>6) (CO3,K3)

7. Answer any one of the following:-

7-a. Below are the given yield kg for 4 varieties A,B,C,D of seeds. Prepare ANOVA table and test that varieties differ significantly. 6

A	B	C	D
20	25	24	23
19	23	20	20
21	21	22	20

Given the tabulated value of F at 5% level of significance is 8.85. (CO4, K3)

7-b. 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)

8. Answer any one of the following:-

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

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

Item	1880		1889	
	Price	Quantity	Price	Quantity
A	15	22	16	30
B	13	18	4	11
C	3	10	5	20
D	11	4	3	7