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Subject Code:- BSPGDT103

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, NIET BUSINESS SCHOOL, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

PGDM

TRIMESTER: I - THEORY EXAMINATION (2024 -2025)

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. The algebraic sum of the deviations from mean is(CO1, K1) 1

(a) Maximum

(b) Minimum

(c) zero

(d) None of the above

1-b. 1

Karl Pearson's coefficient of correlation is defined by(CO2,K1)

(a) $r_{xy} = \frac{\sum((x_i - \bar{x})(y_i - \bar{y}))}{\sqrt{(\sum(x_i - \bar{x})^2 \sum(y_i - \bar{y})^2}}$

(b) $r_{xy} = \frac{\sum(x - \bar{x})(y - \bar{y})}{n\sigma_x\sigma_y})$

(c)

$$r(x,y) = \frac{n\sum xy - \sum x \sum y}{\sqrt{(n\sum x^2 - (\sum x)^2)}\sqrt{(n\sum y^2 - (\sum y)^2)}}$$

(d) All of the above

1-c. Two unbiased coins are tossed. What is the probability of getting at most one head (CO3,K2) 1

(a) 1/2

(b) 1/3

(c) 1/6

(d) 3/4

1-d. In the standard normal curve the area between z=-1 and z=1 is nearly: (CO4,K3) 1

(a) 68%

(b) 25%

(c) 10%

(d) 20%

1-e. Which of the following cannot be a component for a time series plot (CO5,K3) 1

(a)
Seasonality

(b)
Trend

(c)
Cyclical

(d)

Noise

2. Attempt all parts:-

2.a. 2

Give the difference between a sample and a population (CO1,K1)

2.b. 2

Write the interpretation of the *Y* intercept and the slope in the simple linear regression equation.(CO2,K1)

2.c. 2

Write Addition theorem of probability. (CO3,K2)

2.d. Define Binomial distribution. (CO4,K2) 2

2.e. 2

Define Time Series. (CO5,K3)

SECTION-B 15

3. Answer any three of the following:-

3-a. 5

Define statistics. Explain the importance of statistics with reference to business and industry.(CO1,K1)

3-b. The information about Sales turnover and advertising expenses given below: 5 (CO2,K1)

	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.

3.c. 5

If 40% of boys opted for maths and 60% of girls opted for maths, then what is the probability that maths is chosen if half of the class's population is girls(CO3,K2)

3.d. Find the moment generating function of the discrete binomial distribution given by 5 by $P(x) = {}^{n}C_{x}\, p^{x}\, q^{n-x}$ where $q = 1 - p$. (CO4,K2)

3.e. 5

"Index Numbers are devices for measuring changes in the magnitude of a group of related variables". Discuss this statement and point out the important uses of index numbers. (CO5,K3)

SECTION-C 30

4. Answer any one of the following:-

4-a. Calculate mean, median and mode: (CO1,K1) 6

x	0-10	10 -20	20-30	30-40	40-50	50-60	60-70
f	3	6	11	24	28	16	9

4-b. Find mean, median and mode of the give data: (CO1,K1) 6

Variable	10-20	10-30	10-40	10-50	10-60	10-70	10-80	10-90
Frequency	4	16	56	97	124	137	146	150

5. Answer any one of the following:-

5-a. From the following data collection, find the rank correlation coefficient after making adjustment for tied ranks.(CO2,K1) 6

X	48	33	40	9	16	16	65	24
Y	13	13	24	6	15	4	20	9

5-b. Two judges in a beauty contest gives the rank to the ten competitors in the following order:(CO2,K2) 6

A	6	4	3	1	2	7	9	8	10	5
B	4	1	6	7	5	8	10	9	3	2

Do the judges appear to agree in their standard?

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

6-a. 6

Explain what you understand by the term 'probability'. How the concept of probability is relevant to decision making under uncertainty. (CO3,K2).

6-b. 6

State Baye's Theorem. 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. What is the probability that it was manufactured by machine B. (CO3,K2).

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

7-a. Assuming the probability of male birth as ½, find the probability distribution of number of boys out of 5 births. Find the probability that a family of 5 children have 6
(i) at least one boy
(ii) at most 3 boys(CO4,K2)

7-b. What is probability? Explain the calculation of probability under the classical approach. (CO4,K2) 6

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

8-a. Define Fisher's ideal formula for preparing index number Explain it satisfy the time reversal test and factor reversal test. (CO5,K3) 6

8-b. Fit a straight-line trend for the following data of a company by the method of least squares and tabulate the trend values and also estimate the sale in 2006. Convert the trend equation on monthly basis: .(CO5,K3) 6

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