Roll No _____ (To be filled in by the candidate) (Academic Sessions 2020 – 2022 to 2023 – 2025)

STATISTICS   224 – 1st Annual (INTER PART – I)   Time Allowed : 20 Minutes
Q.PAPER – I (Objective Type)   **PAPER CODE = 6187**   Maximum Marks : 17

Note : Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling two or more circles will result in zero mark in that question.   *LHR–24*

1-1	In a discrete probability distribution the sum of all the probabilities is :	
	(A) 0 (B) 1 (C) -1 (D) ∞	
2	The standard deviation is always computed from :	
	(A) Mean (B) Median (C) Mode (D) G.M	
3	Which one is correct :	
	(A) G.M > H.M (B) H.M > G.M (C) H.M > A.M (D) G.M > A.M	
4	When 'r' objects chosen from 'n' objects without regard of order is called :	
	(A) Permutation (B) Combination (C) Factorial (D) Multiplication	
5	The price index $P_{on} = \dfrac{\Sigma p_n q_n}{\Sigma p_o q_n} \times 100$ is :	
	(A) Value index (B) Fisher's index (C) Laspeyre's index (D) Paasche's index	
6	A numerical characteristics of a sample is called :	
	(A) Statistic (B) Parameter (C) Variable (D) Population	
7	In a hypergeometric distribution N = 6, n = 2, K = 3 then the mean is :	
	(A) 2 (B) 3 (C) 1 (D) 4	
8	If $\Sigma (X - 20) = 25$ and $\Sigma (X - 18) = 0$, then arithmetic mean is :	
	(A) 20 (B) 18 (C) 25 (D) Zero	

(Turn Over)

(2)

1-9	If $P (A \cap B) = 0$ then events 'A' and 'B' are called :	
	(A) Mutually exclusive (B) Exhaustive (C) Independent (D) Dependent	
10	Life of a T.V. tube is a :	
	(A) Discrete variable (B) Continuous variable (C) Qualitative variable (D) Constant	
11	If P_{01} (Laspeyre's) = 110, P_{01} (Paasche's) = 120 then P_{01} (Fisher's) is :	
	(A) 110 (B) 120 (C) Zero (D) 114.89	
12	Classification of data according to locations or areas is called --- classification :	
	(A) Temporal (B) Qualitative (C) Geographical (D) Quantitative	
13	For a binomial distribution $p = q = \dfrac{1}{2}$ then the distribution is :	
	(A) Symmetrical (B) Positively skewed (C) Negatively skewed (D) Not exists	
14	A number assigned to outcome of a random experiment is called :	
	(A) Random number (B) Random variable (C) Constant (D) Sample space	
15	The parameters of hypergeometric distribution are :	
	(A) n, N (B) n, K (C) N, K (D) n, N, K	
16	Mean deviation for data 5, 5, 5 is :	
	(A) 5 (B) 25 (C) Zero (D) Negative	
17	An ogive is a :	
	(A) Frequency curve (B) Frequency polygon (C) Histogram (D) Cumulative frequency polygon	

SECTION – I

2. Write short answers to any EIGHT (8) questions :   16

    (i) Describe the limitations of Statistics.

    (ii) Differentiate between parameter and statistic.

    (iii) Write sources of secondary data.

    (iv) What is meant by " Measures of Central Tendency"?

    (v) Calculate mean if n = 10, $\Sigma u = 100$, h = 2, where D = X – 50

    (vi) Write down any two properties of geometric mean.

    (vii) Find the value of median for the data : 3, -2, -1, -3, 0

    (viii) If mode = 75, mean = 70, find median.

    (ix) Name the 3 basic types of index numbers.

    (x) Differentiate between simple and composite index number.

    (xi) How link relatives are computed?

    (xii) Given $\Sigma p_0 = 2550$ and $\Sigma p_1 = 2590$. Find price index number by using simple aggregative index method.

3. Write short answers to any EIGHT (8) questions :   16

    (i) What is classification?

    (ii) Write down the main parts of the table.

    (iii) Define the term relative frequency and cumulative frequency.

    (iv) Describe absolute dispersion.

    (v) Given $\bar{x} = 10$ and var (x) = 4, find $\bar{y}$ and var (y) when y = 2x – 1

    (vi) If lower quartile is 20 and quartile deviation is 5, find upper quartile.

    (vii) Define range and its co-efficient.

    (viii) If S.D. of a distribution is 4, find 2nd moment about mean.

    (ix) Explain properties of random experiment.

    (x) Write the sample space when 3 coins are tossed.

    (xi) Differentiate between simple and compound events.

    (xii) What is meant by conditional probability?

4. Write short answers to any SIX (6) questions :   12

    (i) Define continuous random variable.

    (ii) What is random experiment?

    (iii) What is meant by mathematical expectation?

    (iv) If E(X) = 2, then find E (2X + 3)

    (v) Calculate mean and variance of binomial distribution, if n = 5 and $q = \dfrac{1}{3}$

    (vi) Write down the probability function of hypergeometric distribution.

    (vii) Explain and define binomial experiment.

(Turn Over)

4. (viii) Which type of sampling is associated with binomial distribution?

   (ix) Write down the parameters of hypergeometric distribution.

SECTION – II

Note : Attempt any THREE questions.

5. (a) The A.M. and G.M of three numbers are 34 and 18 respectively. Find all three numbers, when the G.M of the first two numbers is 9.   4

   (b) The following data has been obtained from a frequency distribution of a continuous variable x after making the substitution : $u = \dfrac{x - 136.5}{6}$:   4

u	-4	-3	-2	-1	0	1	2	3
f	2	5	8	18	22	13	8	4

Calculate H.M.

6. (a) What will be the standard deviation and the variance in each of the following cases :   4
(i) 2x   (ii) x + 2   (iii) 2x + 4   if var(x) = 25

   (b) Calculate the first three moments about mean for the observations :   4
81, 87, 90, 93, 94, 95

7. (a) Construct the following weighted I.No's of prices for the year 1981 from the data given below :   4
(i) Laspayre's I.No   (ii) Paasche's I.No.

Commodity	Prices		Quantity	
	1980 (Base)	1981	1980 (Base)	1981
A	10	12	20	22
B	8	8	16	18
C	5	6	10	11
D	4	4	7	8

   (b) Find the probability $P(A \cap B) = ?$ given that $P(A) = 0.25$, $P(B) = 0.60$ Assuming that A and B are independent.   4

8. (a) Let X be a random variable with the probability distribution as follows :   4

X	1	2	3	4	5
f(X)	0.125	0.350	0.300	0.125	0.100

Show that $E(3X - 2) = 3E(X) - 2$

   (b) A continuous random variable ' x ' has density function :   4
$f(x) = 2x$ for $0 \le x \le 1$
        $= 0$ elsewhere

Find $P(0 \le x \le 0.5)$

9. (a) If 20% of the bolts produced by a machine are defective, determine the probability that out of 4 bolts chosen at random (i) Zero defective (ii) 2 bolts are defective   4

   (b) A committee of size 3 is selected from 4 men and 2 women. Find the probability distribution by hypergeometric experiment for the number of men on the committee.   4