

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 $P_{on} = \frac{\sum p_n q_n}{\sum p_o q_n} \times 100$ 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 $\sum (X - 20) = 25$ and $\sum (X - 18) = 0$, 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 $p = q = \frac{1}{2}$ 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

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SECTION – I

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

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- (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 :

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- (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 $\text{var}(x) = 4$, find \bar{y} and $\text{var}(y)$ 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 :

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- (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 $q = \frac{1}{3}$
- (vi) Write down the probability function of hypergeometric distribution.
- (vii) Explain and define binomial experiment.

(2)

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 : $u = \frac{x-136.5}{6}$: 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 $\text{var}(x) = 25$
(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 $0 \leq x \leq 1$
 $= 0$ elsewhere
Find $P(0 \leq x \leq 0.5)$
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