

Roll No _____ (To be filled in by the candidate) (Academic Sessions 2019 – 2021 to 2022 – 2024)

STATISTICS

223 – 1st Annual (INTER PART – I) Time Allowed : 20 Minutes

Q.PAPER – I (Objective Type)

PAPER CODE = 6181

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-11-23*

1-1	Yield from a plot is ---- variable : (A) Discrete (B) Continuous (C) Attribute (D) Categorical
2	Teaching and research journals are --- sources for collection of data : (A) Primary (B) Secondary (C) Local (D) Semi-official
3	Median divides the set of data into --- equal parts : (A) 2 (B) 4 (C) 10 (D) 100
4	If $y = ax + b$ then $\bar{y} = \text{---}$: (A) $a\bar{x}$ (B) $\bar{x} + b$ (C) $a\bar{x} + b$ (D) \bar{x}
5	$\Sigma(y - \bar{y}) = \text{---}$: (A) 0 (B) 1 (C) Least (D) > 0
6	If variance of a set of data is 25, then its standard deviation is : (A) 25 (B) 12.5 (C) 7 (D) 5
7	First moment about mean is always : (A) Positive (B) 0 (C) Mean (D) 1
8	If $y = ax + b$ then $\text{var}(y) = \text{---}$: (A) $a \text{var}(x)$ (B) $a^2 \text{var}(x) + b$ (C) $a^2 \text{var}(x)$ (D) $a \text{var}(x) + b$
1-9	Laspeyre's Index No. is also called : (A) Base year weighted (B) Current year weighted (C) Ideal (D) Simple
10	In chain base method, base period is : (A) Fixed (B) Constant (C) First (D) Not fixed
11	When a coin is tossed three times, $n(s) = \text{---}$: (A) 2 (B) 4 (C) 8 (D) 6
12	Probability of drawing a card of ace is : (A) $\frac{1}{2}$ (B) $\frac{1}{13}$ (C) $\frac{1}{4}$ (D) $\frac{1}{5}$
13	$E(X^2) = 29$ and $E(X) = 4$, then $\text{Var}(X) = \text{---}$: (A) 25 (B) 13 (C) $\sqrt{13}$ (D) 5
14	A random variable is also named as : (A) Chance variable (B) Discrete variable (C) Qualitative variable (D) Attribute
15	No. of parameters in hyper-geometric distribution : (A) 1 (B) 2 (C) 3 (D) 4
16	Mean of binomial distribution : (A) nq (B) pq (C) npq (D) np
17	Limit of binomial distribution is : (A) 0 to n (B) 0 to 1 (C) $-\infty$ to $+\infty$ (D) 0 to ∞

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SECTION – I

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

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- (i) Describe the importance of statistics.
- (ii) Define “Statistics” in plural sense.
- (iii) Define arithmetic mean.
- (iv) Define harmonic mean.
- (v) In a distribution, Mean is “ 50 ” and Median is “ 10 ”. Find Mode of the distribution.
- (vi) If for 10 observations, $\Sigma(X - 23) = -17$, find the value of Mean.
- (vii) Write down any two merits of “ Median ”.
- (viii) Define composite index number.
- (ix) Define un-weighted index number.
- (x) What is fixed base method?
- (xi) Define Fisher Index Number.
- (xii) If $\Sigma p_n \cdot q_o = 460$, $\Sigma p_o \cdot q_o = 115$, compute Laspeyre’s Index Number.

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

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- (i) Write down the main parts of a table.
- (ii) Differentiate between ungroup data and group data.
- (iii) Define range. How will you calculate it for grouped data?
- (iv) Write down the main properties of S.D.
- (v) What is Kurtosis?
- (vi) If $Q_1 = 88.03$ and $Q_3 = 94.90$, find quartile deviation.
- (vii) If $X = 30, 31, 32, 33, 34, 35, 36, 37$, find range and its co-efficient.
- (viii) How we calculate co-efficient of quartile deviation?
- (ix) Define combination.
- (x) Define sample space.
- (xi) What are dependent events?
- (xii) What is factorial?

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

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- (i) Define binomial random experiment.
- (ii) If $n = 10$ and $p = 0.4$, then find the mean and variance of binomial distribution.
- (iii) Define hypergeometric experiment.
- (iv) If $N = 7$, $n = 5$ and $k = 2$, find $P(X = 0)$
- (v) Define hypergeometric probability distribution.
- (vi) What do you understand by random number?
- (vii) Differentiate between discrete random variable and continuous random variable.

(Turn Over)

(2)

4. (viii) Define mathematical expectation.

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(ix) Given that $E(X) = 0.63$ and $\text{Var}(X) = 0.2331$, then find $E(X^2)$ **SECTION - II****Note : Attempt any THREE questions.**

5. (a) Consider the following data :

Classes	40 – 50	50 – 60	60 – 70	70 – 80	80 – 90
Frequency	4	8	16	8	4

Calculate Harmonic Mean.

(b) Find the value of mode from the data given below :

Marks	10 – 14	15 – 19	20 – 24	25 – 29	30 – 34
f	2	4	8	6	3

6. (a) Find mean deviation from the median from the following data :

Age	5 – 10	10 – 15	15 – 20	20 – 25
f	10	20	30	15

(b) Find the co-efficient of Q.D. from the following data :

Groups	5 – 9	10 – 14	15 – 19	20 – 24	25 – 29
f	3	4	12	6	5

7. (a) Given the prices of three commodities, construct the chain indices using median as an average :

Years	Commodities		
	A	B	C
2014	105	84	119
2015	110	96	126
2016	110	103	132
2017	120	116	144

(b) From a pack of 52 playing cards, two cards are chosen at random. What is the probability that :

(i) Both are diamonds. (ii) One is ace and other is king.

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

X	1	2	3	4	5
$P(X)$	0.125	0.450	0.250	0.050	0.125

Show that $E(5X + 8) = 5E(X) + 8$

(b) A continuous r.v 'X' has p.d.f. as :

$$f(x) = \frac{x+1}{8}, \quad 2 \leq x \leq 4$$

Find $P(2.4 < x < 3.5)$ 9. (a) A fair die is thrown 6 times. Let X be a random variable showing number of sixes. Find (i) $P(X = 2)$ (ii) $P(X = 6)$ (b) Five balls are drawn from a box containing 4 white and 7 black balls. If X denotes the number of black balls drawn, find (i) $P(X = 2)$ (ii) $P(X = 5)$