

Roll No _____ (To be filled in by the candidate) (Academic Sessions 2018 – 2020 to 2021 – 2023)
STATISTICS 222 -(INTER PART – I) Time Allowed : 20 Minutes
Q.PAPER – I (Objective Type) **PAPER CODE = 6185** 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.

1-1	The index given by $\frac{\sum p_n q_n}{\sum p_o q_n}$ is : (A) Laspeyre's index (B) Paasche's index (C) Value index (D) Fisher's index
2	Geometric mean of 2 and 8 is : (A) 8 (B) 4 (C) 5 (D) 2
3	Which of the following cannot be the probability of an event : (A) 1.75 (B) Zero (C) 0.36 (D) 0.82
4	Total angles of a pie chart are : (A) 360° (B) 180° (C) 190° (D) 90°
5	In a binomial distribution, the successive trials are : (A) Independent (B) Dependent (C) Mutually exclusive (D) Fixed
6	If $\sum (X - \bar{X})^2 = 232$ and $n = 9$, then m_2 is (A) 24.78 (B) 25.78 (C) 26.78 (D) 27.78
7	If $\sum X = 400$ and $\sum X^2 = 25$, then n is (A) 12 (B) 14 (C) 18 (D) 16
8	Quantities which do not vary (A) Variables (B) Constants (C) Statistic (D) All
9	In chain base method, the base period is : (A) Fixed (B) Constant (C) Changed (D) None
10	$E[X - E(X)]$ is equal to : (A) Variance (B) Standard deviation (C) Mean (D) Zero
11	First moment about mean is always equal to : (A) 1 (B) -1 (C) 2 (D) Zero
12	If $X = a$, then \bar{X} is equal to : (A) x (B) 0 (C) a (D) 1
13	Binomial distribution is negatively skewed if : (A) $p < q$ (B) $p > q$ (C) $p = q$ (D) $p = 0.5$
14	If a distribution is mesokurtic, then : (A) $\beta_2 = 3$ (B) $\beta_2 < 3$ (C) $\beta_2 > 3$ (D) $\beta_2 \neq 3$
15	The number of values falling in a particular category is called : (A) Tally mark (B) Class (C) Frequency (D) Class mark
16	Probability of sample space is equal to : (A) Zero (B) 1 (C) -1 (D) 2
17	If X is a random variable, then $V(X)$ is : (A) $E[X - E(X)]$ (B) $E[X - E(X)]^2$ (C) $E(X^2) - [E(X)]^2$ (D) Both B and C

SECTION – I

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

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- (i) Differentiate between population and sample.
- (ii) Define parameter with example.
- (iii) What is statistical average?
- (iv) What is the formula of combined arithmetic mean?
- (v) If the values of Q_2 , D_5 and P_{50} are equal to 27.12, then find median.
- (vi) Explain mode with example.
- (vii) Average = 70, number of values = 5, find the sum of values.
- (viii) Define geometric mean.
- (ix) Explain the chain base method.
- (x) What is Laspeyre's index number?
- (xi) Why Fisher's index number is called ideal?
- (xii) What is base period?

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

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- (i) What are the different methods of presentation of data?
- (ii) Define class boundaries.
- (iii) Given that $Q_3 = 178$, $Q_1 = 120$, find the value of Q_2 .
- (iv) How is variance defined, also write its formulae?
- (v) A student calculated mean and standard deviation of 25 observations as 20 and 4 respectively. Find the value of coefficient of variation.
- (vi) Define symmetrical distribution.
- (vii) If variance is 5 and third moment about mean is -12.8 , find b_1 and discuss the distribution.
- (viii) If mean = 20, mode = 15 and coefficient of skewness equal to 1, then find variance.
- (ix) Define combination with example.
- (x) What is the answer of 6C_4 and 6P_4 ?
- (xi) Define the terms (i) Event. (ii) Sure event.
- (xii) If $P(A) = 0.6$, and $P(B/A) = 0.4$, then find $P(A \cap B)$

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

12

- (i) Three coins are tossed, let X be the number of heads. Write all possible values for X .
- (ii) Define continuous random variable.
- (iii) What is meant by probability distribution?
- (iv) What are properties of expectation?
- (v) Given a random variable X with $E(X) = 0.63$ and $\text{var}(X) = 0.2331$, find $E(X^2)$
- (vi) What are properties of binomial distribution?
- (vii) In a binomial distribution mean = 4.2 and variance = 1.68, find its both parameters.

(Turn Over)

(2)

4. (viii) Define hyper-geometric probability distribution.

(ix) A random variable X has hyper-geometric distribution with $N = 10$, $n = 4$ and $K = 3$, find $P(X = 0)$

SECTION – II

Note : Attempt any **THREE** questions.

5. (a) Find the mean for the following distribution :

Classes	0 – 10	10 – 40	40 – 90	90 – 100
f	40	110	150	20

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(b) Find the value of upper quartile : Q_3

Groups	0 – 4.9	5 – 9.9	10 – 14.9	15 – 19.9
f	3	4	9	4

4

6. (a) Calculate mean deviation from median from the given data :

Marks	20 – 29	30 – 39	40 – 49	50 – 59
No. of students	3	20	13	6

4

(b) Compute the coefficient of skewness using the averages and standard deviation.

4

Groups	0 – 10	10 – 20	20 – 30	30 – 40
f	4	12	7	2

7. (a) Find index number taking (i) the year 1930 as base. (ii) average of 1st 3 years as base :

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Years	1930	1931	1932	1933	1934	1935	1936	1937	1938
Prices	4	5	6	7	8	10	9	10	11

(b) Two cards are drawn from a well-shuffled pack of 52 cards. Find the probability that :
(i) One is king and the other is queen. (ii) Both are of different colours.

4

8. (a) A fair coin is tossed three times. Set ' X ' be a random variable which denotes the number of heads. Make the probability distribution of X .

4

(b) A continuous random variable ' X ' has probability density function given by :
 $f(x) = c \cdot x$ for $0 < x < 2$

Find (i) C (ii) $P(1 < x < 1.5)$

4

9. (a) In a binomial distribution, $n = 4$ and $p = \frac{1}{3}$. Obtain the probability distribution of 0, 1, 2, 3 and 4 successes.

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(b) Given that ' X ' is a hypergeometric random variable with $N = 8$, $n = 3$ and $K = 5$. Compute $P(X \leq 3)$

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