

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.

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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) $360^\circ$	(B) $180^\circ$	(C) $190^\circ$	(D) $90^\circ$
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 are	(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**

222

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

- (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 :** **16**

- (i) What are the different methods of presentation of data?
- (ii) Define class boundaries.
- (iii) Given that  $Q_3 = 178$ ,  $Q_1 = 133$ . Find the value of  $Q_2$ .
- (iv) How is variance defined, also give 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.

(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 :  $Q_3$

4

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

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

4

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

(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 1<sup>st</sup> 3 years as base :

4

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 :

$$f(x) = c \cdot x \quad \text{for } 0 < x < 2$$

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.

4

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

4