| ☆☆ | Roll No _____ |
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Inter - (Part-I) - A / 2024
(For All Sessions)

| Paper Code | 6 | 1 | 8 | 4 |
|---|---|---|---|---|

# Statistics (Objective)

Marks : 17 Time: 20 Minutes

RWP-24

Note:- Write answers to the questions on the objective answer sheet provided. Four possible answers are given. Which answer you consider correct fill the corresponding circle A,B,C or D in front of each question with marker or ink on the answer sheet provided.

1.1 The sum of the probability in discrete probability distribution is :

(A) One (B) Two (C) Zero (D) $-1$

2. A binomial probability distribution has variance :

(A) npq (B) nq (C) $\sqrt{npq}$ (D) $n^2p^2q^2$

3. Hypergeometric probability distribution has parameters :

(A) 1 (B) 2 (C) 3 (D) 4

4. In Binomial probability distribution trials are :

(A) Independent (B) Dependent
(C) Sometimes Independent (D) Always dependent

5. A quantity computed from sample is called :

(A) Parameter (B) Statistic (C) population (D) Sample

6. Statistical laws are true:

(A) Always (B) Not in the long run (C) On the average (D) None of these

7. Total of relative frequency is :

(A) Two (B) Half (C) Three (D) One

8. A pie diagram is represented by a :

(A) Square (B) Triangle (C) Rectangle (D) Circle

9. The sum of deviations from Arithmetic Mean is :

(A) 1 (B) 2 (C) 3 (D) 0

10. Geometric Mean of 2,4,8 is :

(A) 4 (B) Zero (C) 6 (D) 16

11. The variance of 5,5,5 and 5 is :

(A) 5 (B) Zero (C) 25 (D) 125

12. For a symmetrical distribution

(A) $b_1 > 0$ (B) $b_1 < 0$ (C) $b_1 = 0$ (D) $b_1 = 3$

13. Link relatives can be obtained by dividing $P_n$ by :

(A) $P_0$ (B) $q_n$ (C) $q_{n-1}$ (D) $p_{n-1}$

14. Index Number for base period is always :

(A) 100 (B) 150 (C) 50 (D) 200

15. The probability of red card out of 52 cards is :

(A) $\frac{1}{4}$ (B) $\frac{4}{52}$ (C) $\frac{1}{2}$ (D) Zero

16. If $A \cap B = \emptyset$ then A and B are :

(A) Not Mutually Exclusive (B) Equally likely
(C) Exhaustive (D) Mutually Exclusive

17. The expected value of a random variable is equal to its :

(A) Variance (B) S.D. (C) Mean (D) Covariance

Roll No _____

HSSC - (Part-I) – A / 2024
(For All Sessions)

# Statistics (Subjective)

Time: 2:40 Hours  Marks : 68

RWP-24

## Section - I

2. Give short answers of any eight parts from the following . (2x8=16)

(i) Explain giving examples, the term data.
(ii) Narrate any two sources of collecting primary data.
(iii) Describe any two characteristics of Statistics.
(iv) Explain combined mean with formula.
(v) Describe the empirical relation between mean, median and mode for moderately skewed distribution.
(vi) Given that $u = \frac{X-150}{5}$, $\sum fu = 100$ and $\sum f = 200$. Find $\bar{X}$.
(vii) Find the Modal letter of the word "DISTRIBUTION"
(viii) Describe the weighted aggregative price index number.
(ix) Define the term price relative with formula.
(x) If link relatives are 100,107,114 and103. Find chain indices.
(xi) Given that $X_1 = 4$ and $X_2 = 16$. Show that G.M. = $\sqrt{A.M. \times H.M.}$
(xii) Given that $\sum p_1 q_1 = 1400$, $\sum p_2 q_2 = 1600$, $\sum p_0 q_1 = 1360$ and $\sum p_0 q_2 = 1560$. Compute Paasche's price index number.

3. Give short answers of any eight parts from the following . (2x8=16)

(i) Define primary data.
(ii) Enlist the methods of collecting Secondary data.
(iii) What is frequency distribution?
(iv) Define Q.D.(Quartile Deviation).
(v) $n = 15$, $\sum X = 480$, $\sum X^2 = 15735$. Find the Coefficient of Variation.
(vi) $\bar{X} = 200$, C.V. = 7 %. Find the value of variance.
(vii) Mean = 29.6, Mode = 24.8, S= 15, Find Coefficient of skewness.
(viii) What is venn-diagram?
(ix) Define moments.
(x) Suppose P(A) = $\frac{1}{3}$, P(B) = $\frac{1}{2}$ and P($\bar{A} \cap B$) = $\frac{1}{2}$. Find P($\bar{A} \cap \bar{B}$)
(xi) Define the terms sample space and events.
(xii) If A and B are two independent events such that P(A) = 0.2, P(B) = 0.15, then evaluate P(A /B).

4. Give short answers of any six parts from the following. (2x6=12)

(i) Describe two properties of mathematical expectation.
(ii) Write down the properties of probability density function.
(iii) If Var(X) = 3, compute Var(3X).
(iv) Given that E(X) = 200 and C.V. = 7%. Find Var(X).
(v) Write down formulae for mean and standard deviation of binomial distribution.
(vi) In a binomial distribution n = 5, q = $\frac{1}{2}$. Find P(X=3).
(vii) Is it possible that in a binomial distribution mean is 6 and variance is 6.25. Give reason.
(viii) In a hypergeometric distribution n = 5, k = 4 and N = 11. Compute its mean.
(ix) A committee of size 3 is selected from 4 men and 2 women. Find the probability that there is only one man in the committee.

## Section - II

Note:- Attempt any three questions from the following. (8x3=24)

5. (a) The following data is the frequency distribution of number of leaves on the branches of a tree: (4)

| No. of leaves | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|
| No. of branches | 3 | 8 | 11 | 18 | 20 | 13 |

Find the mean and the mode of number of leaves per branch.

(b) The reciprocals of 8 values of X are given below : (4)

0.0400, 0.0345, 0.0540, 0.0333, 0.0175, 0.0632, 0.0113, 0.0210. Calculate the Arithmetic Mean and Harmonic Mean.

6. (a) Calculate mean deviation from median from the following data : (4)

| Classes | 15-19 | 20-24 | 25-29 | 30-34 |
|---|---|---|---|---|
| $f$ | 2 | 4 | 6 | 3 |

(b) What can you say about skewness in each of the following cases : (4)

(i) Median = 26, $Q_3$ = 38, $Q_1$ = 14 (ii) Mean = 1403, Mode = 1487, Standard Deviation = 12

7. (a) From the data given below, construct Consumer price Index Number of 1986 on the basis of 1976 by using Aggregate expenditure method: (4)

| Food | Prices | | Quantity |
|---|---|---|---|
| | 1976 | 1986 | 1976 |
| Wheat | 8 | 14 | 4 |
| Rice | 15 | 21 | 2 |
| Daal | 10 | 14 | 1 |
| Oil | 20 | 30 | 5 |
| Ghee | 6 | 12 | 3 |

(b) A pair of fair dice is thrown. If the two numbers appearing are different, find the probability that : (4)

(i) The sum is 6. (ii) The sum is four or less.

8. (a) From an urn containing 4 red and 6 white round marbles, a man draws three marbles at random without replacement. If X is a random variable which denotes the number of red marbles drawn, then what is the probability distribution of X. (4)

(b) A continuous random variable X has probability density function given by : $f(x) = \frac{2}{27}(x+1)$ ; for $2 \le x \le 5$ . Find: (4)

(i) $P(X < 4)$ (ii) $P(3 \le X \le 4)$