

# Statistics

H.S.S.C (11<sup>th</sup>) 1<sup>st</sup> Annual 2024

Roll No. \_\_\_\_\_

(To be written by the candidate)

Paper : I

Objective

Paper Code

6

1

8

1

Marks:17

Time : 20 Minutes

Note: - You have four choices for each objective type question as A, B, C and D. The choice which you think is correct; fill that circle in front of that question number in your answer book. Use marker or pen to fill the circles. Cutting or filling up two or more circles will result no mark.

## SECTION-A

30/1-24

Q.1	Questions	A	B	C	D
1.	Statistics deals with:	Qualitative facts only	Single fact	Aggregative of facts	None of these
2.	The data in their original form are called:	Secondary data	Primary data	Ordered data	Un-official data
3.	A statistical table has at least:	Five parts	Two parts	Three parts	Four parts
4.	Histogram is the graph of:	Qualitative data	Time series	Frequency distribution	Ogive
5.	We must arrange the data before calculating:	Mode	Median	Mean	G.M
6.	$\Sigma(Y - \bar{Y}) = \dots\dots\dots$	0	1	Least	> 0
7.	The square root of second moment about mean is:	Variance	S.D	Q.D	M.D
8.	If $Y = ax + b$ then $Var(Y) = \dots\dots\dots$	$aVar(X)$	$a^2Var(X) + b$	$a^2Var(X)$	$aVar(X) + b$
9.	Laspeyre's index number is also called:	Base year weighted	Ideal	Current year weighted	Simple
10.	The index number for base period is always taken as:	1000	200	100	Zero
11.	Tossing two dice, possible outcomes are:	6	12	8	36
12.	The probability of a red card out of 52 cards is:	$1 - \frac{1}{4}$	$1 - \frac{1}{2}$	$\frac{4}{52}$	1
13.	In a family with two children, how many are girls:	0,1	2	0,1,2,3	0,1,2
14.	If $Var(X) = 9$ then $S.D(2x + 4)$ is:	36	10	6	18
15.	The number of possible outcomes in a Bernoulli Trial is:	Three	Two	Four	One
16.	Variance of the binomial distribution is:	$nP$	$\sqrt{nPq}$	$nPq$	$n$
17.	In hypergeometric distribution $N = 6, n = 2, k = 3$ then means =	1	2	3	6

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Note :- Section B is compulsory. Attempt any THREE Questions from Section C.

**SECTION - B**

*SWL 24*

2. Write short answers to any EIGHT parts. (8x2=16)

- i. Define Statistics.
- ii. Distinguish between qualitative and quantitative variables.
- iii. What are the main functions of descriptive statistics?
- iv. Give the empirical relation between mean, median and mode.
- v. Define median with its formula for grouped data.
- vi. Calculate G.M of 1,1,8.
- vii. Write down the formula for weighted mean and also give its definition.
- viii. Calculate harmonic mean of 2 and 8.
- ix. Define chain base method.
- x. If  $\sum W = 20$  and  $\sum WI = 180$ , find cost of living index number.
- xi. Consider the following data  
 $\sum p_0q_0 = 35310, \sum p_1q_0 = 41140, \sum p_1q_1 = 46707$  and  
 $\sum p_0q_1 = 39644$ . Compute "base year weighted" and "current year weighted" index.
- xii. How can you define consumer price index number?

3. Write short answers to any EIGHT parts. (8x2=16)

- i. What is classification?
- ii. Define class boundaries.
- iii. Name the important parts of table.
- iv. What is meant by dispersion?
- v. Define standard deviation.
- vi. Compute coefficient of quartile deviation, if  $Q_1 = 10.20$  and  $Q_3 = 58.29$
- vii. Write down any two properties of variance.
- viii. Calculate upper quartile for the given: 13,3,7,15,17,5,23,27
- ix. Define exhaustive events.
- x. Calculate  ${}^6C_2$  and  ${}^6P_2$
- xi. What is the range of probability?
- xii. For two mutually exclusive events A and B, if  $P(A)=0.25$  and  $P(B)=0.40$  then find  $P(A \cup B)$ .

4. Write short answers to any SIX parts. (6x2=12)

- i. What do you mean by expected value?
- ii. Enlist the properties of a probability density function.
- iii. Given  $E(X) = 0$  and  $E(X^2) = 0.7$ , find  $E(3X^2 - 2X + 4)$
- iv. If  $E(X^2) = 400$  and  $SD(X) = 12$ , find  $E(X)$
- v. Write down any two properties of binomial experiment.
- vi. What is Bernoulli trial?
- vii. What is hypergeometric experiment?
- viii. For hypergeometric distribution  $N = 40, n = 5$  and  $k = 4$ , find mean and variance.
- ix. If  $n = 4, P = \frac{1}{2}$ , find  $P(X = 3)$

(PTO)

**SECTION - C** Attempt any THREE Questions Each question carries 4+4=8 marks. (8x3=24)

5. (a) Find geometric mean for the following data:

Classes	10 - 19	20 - 29	30 - 39	40 - 49	50 - 59
$f$	05	25	40	20	19

(b) Calculate median for the following data:

$X$	18	19	20	21	22	23	24
$f$	4	6	9	12	6	5	2

6. (a) For the following data, calculate mean deviation about median.  
7,10,6,12,9,14,15,14 and 8.

(b) First four moments about  $X = 20$  are given as -2,15, -25 and 80 respectively. Find corresponding moments about mean.

7. (a) Given the following information:

$\sum p_0q_0 = 3600, \sum p_1q_0 = 4300, \sum p_1q_1 = 4890$  and  $\sum p_0q_1 = 4100$ , find Paasche's and Laspeyre's Price Index Number.

(b) Three coins are tossed, find the probability.

- i. No head appears
- ii. One head appears

8. (a) The probability distribution of a random variable X is given below. Find its mean and variance.

$x$	1	2	3	4	5
$P(x)$	0.1	0.2	0.4	0.2	0.1

(b) A continuous random variable X has the probability density function as  $f(x) = cx, 0 < x < 2$ : Find

- i. The value of C
- ii.  $P\left(\frac{1}{2} < X < \frac{3}{2}\right)$

9. (a) An event has the probability  $p = \frac{3}{8}$ . Find the complete binomial distribution for  $n = 5$  trials.

(b) There are 7 good and 3 defective items. Two items are selected randomly without replacement. Find the probability that one is good and one is defective.