

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

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Q.1	Questions	A	B	C	D
1.	The data collected from research journals are:	Primary data	Fractional data	Official data	Secondary data
2.	Column caption is called:	Title	Body	Box head	Stub
3.	Which of the given averages is affected by extreme values?	A.M.	G.M	H.M.	Median
4.	For a certain distribution $\sum(x-10) = 5, \sum(x-10)^2 = 20, \sum(x-10)^3 = 0$ then $\bar{x} =$	5	20	10	None of these
5.	Which of the given averages cannot be less than zero?	A.M.	G.M	H.M.	Median
6.	The S.D. is always calculated from:	Mean	Median	Mode	H.M.
7.	If $v(X)=4$ and $v(Y)=9$, then $v(2X+Y)$ is:	13	17	25	1
8.	Which of the given is a relative measure of dispersion?	S.D	Q.D	C.V	M.D
9.	In chain base method, base period is:	Fixed	Not fixed	Random	Zero
10.	The index given by $\frac{\sum p_n q_n}{\sum p_o q_n} \times 100$ is:	Laspeyre's Index No.	Paasche's Index No.	Fisher Index No.	Value Index
11.	Probability of an event always lies between:	$-\infty$ & ∞	$-\infty$ and 0	0 and 1 (both inclusive)	1 and ∞
12.	An orderly arrangement of objects is called:	Combination	Permutation	Power set	Universal set
13.	$E(x)$ is equal to:	A.M	G.M	H.M	Median
14.	$\text{Var}(2X+5) =$	$2 \text{Var}(X)+5$	$4 \text{Var}(X)$	$4 \text{Var}(X)-25$	$4 \text{Var}(X)+25$
15.	Range of Binomial random variable is:	0 to n	0 to ∞	0 to ∞	1 to n
16.	Number of parameters of Hypergeometric distribution is:	4	2	3	5
17.	If $n=10$ and $q=\frac{1}{2}$, then mean of binomial distribution is:	20	10	2.5	5

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

SECTION - B

2. Write short answers to any Eight parts.

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(8x2 = 16)

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i. Define primary data.

ii. What is an attribute?

iii. Define Geometric Mean.

iv. Calculate \bar{X} if $n = 10, \sum \mu = 100, h = 2$ and $A = 50$.

v. Define Deciles.

vi. Write any two properties of a good average.

vii. Define median and write down its formula.

viii. Write the formula of empirical relation between mean, median and mode.

ix. Define index numbers.

x. What is the difference between simple and composite index numbers?

xi. Define base period.

xii. Given that $\sum W = 60.25$ and $\sum WI = 8074.5$, then find consumer price index number.

3. Write short answers to any Eight parts.

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i. What is the cumulative frequency?

ii. What is the frequency curve?

iii. Define the relative dispersion.

iv. What are the moments about origin?

v. Find the co-efficient of skewness, given that $m_2=6, m_3=12$.

vi. Name the distribution for which $b_1=0$ and $b_2=3$.

vii. What is the symmetrical distribution?

viii. If $Q_1=12, Q_2=20$, and $Q_3=25$, find the Bowley's co-efficient of skewness.

ix. Define the impossible event.

x. What are the mutually exclusive events?

xi. A die is rolled. Find the probability of more than four dots.

xii. What is the probability of selecting a red king out of 52 playing cards?

4. Write short answers to any Six parts.

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(6x2 = 12)

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i. State the properties of discrete probability function.

ii. What do you mean by mathematical expectation?

iii. Given that $E(X)=0.55, \text{Var}(X)=1.35$ and $Y=2X+1$, find $E(Y)$ and $\text{Var}(Y)$.

iv. A continuous random variable X has probability density function $f(x) = \frac{cx}{4}$ for $1 \leq X \leq 4 = 0$ elsewhere, find the value of c .

v. For a binomial distribution with $n=6$ and $p=\frac{1}{2}$, find $P(X=1)$.

vi. If X is a hypergeometric random variable with $N=40, n=5$ and $K=8$. Find $\text{Var}(X)$.

vii. What do you mean by Bernoulli trial?

viii. State two properties of binomial distribution.

ix. Define hypergeometric probability function with formula.

Turn the page over

SWL-11-23

SECTION - C

Note: Attempt any Three question. Each question carries 4+4=8 marks. (8x3=24)

5. (a) The frequency distribution given below has been derived from the use of working origin.

If $D = x - 18$, find A.M.

D	-12	-8	-4	0	4	8	12	16
f	2	5	8	18	22	13	8	4

(b) Find the upper quartile for the following frequency distribution:

Height	86 - 90	91 - 95	96 - 100	101 - 105
f	4	10	6	3

6. (a) Calculate mean, standard deviation and coefficient of variation from the following data:

$\sum f = 40, \sum fx = 48, \sum f(x - \bar{x})^2 = 68.4$

(b) Calculate Bowley's coefficient of skewness from the following data.

Weights	118 - 126	127 - 135	136 - 144	145 - 153
f	3	9	12	4

7. (a) Compute the Fisher's ideal price index for the year 2009 by taking 2007 as base year.

Commodity	2007		2009	
	Price	Quantity	Price	Quantity
A	45	90	93	100
B	37	10	64	11
C	27	03	51	05

(b) A digit is selected at random from the first ten natural numbers. Find the probability that the selected digit is:

- (i) an odd
- (ii) less than 5.

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

x	1	2	3	4	5
f(x)	0.125	0.45	0.25	0.05	0.125

Estimate its variance

(b) If f(x) has probability density function $kx^2, 0 < X < 1$, determine the value of k and find probability that

$\frac{1}{3} < X < \frac{1}{2}$

9. (a) A fair coin is tossed five times, what is the probability of getting:

- (i) Exactly three heads
- (ii) At least three heads.

(b) Ten vegetables cans, all of same size, have lost their labels. It is known that 5 contain tomatoes and 5 contain corns. If 5 cans are selected at random, what is the probability that:

- (i) All contain tomatoes.
- (ii) Three or more contain tomatoes.

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Roll No.

(To be filled in by the candidate)

Statistics

H.S.S.C (11th)-A-2022

Time : 20 Minutes

Paper : I

Objective

Marks : 17

Scanned - 22

Paper Code 6 1 8 1

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

Q.1	Questions	A	B	C	D
1.	The uniform of the student is an example of:	Variable	Discrete variable	Continuous variable	Constant
2.	Row caption is also called:	Title	Body	Box-head	Stub
3.	Total angle of the pie-chart is:	270°	300°	320°	360°
4.	The empirical relationship between mean, median and mode is, mode =	3 mean - 2 median	2 mean - 3 median	3 median - 2 mean	2 median - 3 mean
5.	Which of the given average cannot be less than zero?	A.M	G.M	H.M	Median
6.	Which average can only be applicable in qualitative data?	A.M	Median	Mode	H.M
7.	The first moment about origin is:	Zero	One	Mean	Variance
8.	In symmetrical distribution $Q_1 = 4, Q_3 = 12$ then median is:	8	4	16	Zero
9.	The first moment about mean is:	Zero	One	Variance	S.D
10.	In a fixed base method which period is taken as 100 (hundred):	Preceding	Following	Base	Current
11.	Cost of living index no. are:	Simple	Composite	Un-weighted	Chain
12.	${}^n P_r =$	$\frac{n!}{r!(n-r)!}$	$\frac{n!}{r!}$	$\frac{n!}{(n-r)!}$	$\frac{(n-r)!}{n!}$
13.	If A & B are two mutually exclusive events, then $P(A \cap B) =$	0	1	S	ϕ
14.	The probability function cannot be:	< 0	> 0	0	Fractional
15.	Expected value of a constant is:	Zero	One	Two	Constant itself
16.	A binomial distribution has variance:	ng	np	npq	\sqrt{npq}
17.	Hypergeometric distribution has parameters:	n, p	n, p, q	N, n, k	n, k

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(To be filled in by the candidate)

Statistics

H.S.S.C (11th)-A-2022

Time : 2:40 Hours

Paper : I **Sub - 22**

Subjective

Marks : 68

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

SECTION - B

2. Write short answers to any Eight parts. (8 x 2 = 16)

- i. Define discrete variable and give examples.
- ii. What is primary data?
- iii. Describe any two properties of arithmetic mean.
- iv. What are the desirable qualities of a good average (any two)?
- v. Describe any two demerits of geometric mean.
- vi. Compute geometric mean by using the basic definition: 45, 30, 35, 40, 44, 32, 42, 37
- vii. Compute upper quartile (i.e. third quartile) from the given data: 95.05, 94.90, 94.50, 84.60, 88.03.
- viii. If $\sum p_1 q_1 = 272$, $\sum p_0 q_1 = 194$, calculate Paasche's Index number.
- ix. If Laspeyre's Index = 104.5 and Paasche's Index = 103.9. Compute Fisher Index Number.
- x. Describe any two limitations of index numbers.
- xi. Describe the importance of consumer price index numbers.
- xii. If $\sum p_1 q_1 = 280.84$, $\sum p_0 q_1 = 258.18$, compute C.P.I by aggregative expenditure method.

3. Write short answers to any Eight parts. (8 x 2 = 16)

- i. What is frequency histogram?
- ii. Define Class Frequency with an example.
- iii. Enlist the absolute measures of dispersion.
- iv. Differentiate symmetry and skewness.
- v. Define Standard Deviation.
- vi. Given $X = 4, 6, 8, 8, 10$, find mean deviation from mode.
- vii. If $\text{var}(x) = 25$ then find $\text{var}(2x + 4)$
- viii. What would be the shape of the distribution if:
 - (a) Mean = Median = Mode
 - (b) Mean > Median > Mode
 - (c) Mean < Median < Mode
- ix. Explain sample space of two coins.
- x. State additional law for not mutually exclusive events.
- xi. Differentiate between simple and compound events.
- xii. What is meant by dependent event? Give an example.

4. Write short answers to any Six parts. (6 x 2 = 12)

- i. Define the Discrete Random Variable.
- ii. If $E(X) = 5$ and $E(X^2) = 50$, find σ^2 .
- iii. Given below is a function. Is it a probability function?

x	0	1	2
$P(x)$	$\frac{5}{8}$	$\frac{4}{8}$	$\frac{1}{8}$
- iv. What is probability density function?
- v. If $E(X) = 1.15$, then find $E(3X - 5)$
- vi. If $n = 10$, $p = 0.4$, then find variance of binomial distribution.
- vii. In a binomial distribution $n = 3$, $p = \frac{1}{2}$, find $P(X = 3)$.
- viii. Given that $N = 10$, $n = 4$, $k = 3$, find $P(X = 1)$.
- ix. Write any two properties of binomial experiment.

(Turn Over)

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Q.1	Questions	A	B	C	D
1.	The mean deviation is least if deviations are taken from:	Median	Mode	A.M.	G.M.
2.	Link relative is equal to:	$\frac{P_n}{P_0} \times 100$	$\frac{P_r}{P_{r-1}} \times 100$	$\frac{P_0}{P_n} \times 100$	$\frac{P_{n-1}}{P_n} \times 100$
3.	Index number for base period is taken as:	0	1	200	100
4.	${}^4C_3 =$ _____	24	3	4	1
5.	If one event is not affected by the outcome of another event, the two events are said to be:	Dependent	Independent	Mutually Exclusive	Both A and B
6.	If X and Y are random variables, then $E(X - Y)$ is equal to:	$E(X) - E(Y)$	$E(X) + E(Y)$	$X - E(Y)$	$E(X) - Y$
7.	If " C " is a constant, then $E(C) =$ _____	0	1	C^2	C
8.	The mean, median and mode of the binomial distribution $b(x; n, p)$ will be equal when:	$p = 0.5$	$p < 0.5$	$p > 0.5$	None of these
9.	In a binomial, $n = 20$, $P = \frac{3}{5}$. the mean of this distribution is:	60	12	0	8
10.	In a Hypergeometric distribution, the trials are:	Independent	Independent and dependent	Dependent	None of these
11.	If X and Y are independent, then $\text{var}(X - Y)$ is equal to:	$\text{var}(X) - \text{var}(Y)$	1	$\text{var}(X) + \text{var}(Y)$	0
12.	The positive square root of the variance of a distribution is called:	Mean Deviation	Standard Deviation	Range	Quartile Deviation
13.	The sum of deviations of all the values from their arithmetic mean is:	1	2	3	0
14.	The most frequent value in a data set is called:	Mode	Median	A.M.	H.M.
15.	It is the reciprocal of Arithmetic Mean of the reciprocal of all the values.	A.M.	G.M.	Mode	H.M.
16.	The sum of relative frequencies is always equal to:	0	2	1	3
17.	Hourly temperature recorded by Weather Bureau is an example of _____ data.	Discrete	Continuous	Qualitative	Secondary

Note :- Section I is compulsory. Attempt any Three Questions from Section II.

SECTION - I

2. Write short answers to any Eight parts. (8 x 2 = 16)

- i. Define the term "Variable".
- ii. What do you mean by data?
- iii. Find mean of 5, 3, 2, 7, 3.
- iv. Define Geometric Mean.
- v. What is Empirical Relationship between mean, median and mode?
- vi. If Mean = 5, Median = 6, then find Mode.
- vii. If $\sum X = 15$, $n = 3$, then find Mean.
- viii. Define Mode.
- ix. Find Laspeyre's index number if Fisher's=8, Paasche's=4
- x. What is composite index number?
- xi. Define Simple Index Number.
- xii. What is simple aggregative index?

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3. Write short answers to any Eight parts. (8 x 2 = 16)

- i. Differentiate between class limits and class boundaries.
- ii. Write down the main steps in the construction of frequency distribution.
- iii. Write the types of dispersion.
- iv. If $Q_1 = 20$ and $Q_3 = 60$, find coefficient of quartile deviation.
- v. Define Average Deviation.
- vi. What is standard deviation?
- vii. If $\bar{X} = 10$ and $\text{var}(X) = 4$, find \bar{Y} and $\text{var}(Y)$ when $Y = 2x - 1$
- viii. What is relative dispersion?
- ix. What is random experiment?
- x. What is permutation?
- xi. If A and B are independent events with $P(A) = 0.2$ and $P(B) = 0.6$, find $P(A \cap B)$
- xii. State the classical definition of Probability.

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4. Write short answers to any Six parts. (6 x 2 = 12)

- i. Write down properties of Expectation.
- ii. If $E(X) = 4$, $E(Y) = 3.5$, then find $E(X - Y)$.
- iii. What is meant by variance of the Discrete Random Variable?
- iv. Define Probability Distribution.
- v. Define Bernoulli Trial.
- vi. Write down properties of Binomial experiment.
- vii. Define Binomial Probability Distribution.
- viii. A fair coin is tossed 4 times. Find the probabilities of obtaining various number of heads.
- ix. Write down properties of Hypergeometric Experiment.

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SECTION - II

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Each question carries 4 + 4 = 8 Marks

5. (a) The following data has been obtained from a frequency distribution of a continuous variable X after making the substitution: $U = \frac{X - 136.5}{6}$

Compute Harmonic Mean.

U	-4	-3	-2	-1	0	1	2	3
f	2	5	8	18	22	13	8	4

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(b) Calculate Q_1 and Q_3 from the following data:
12, 10, 19, 20, 11, 27, 30, 28, 45, 70, 65, 60.