

Paper Code Number: 2183 Y.CC		2023 (1 st -A) INTERMEDIATE PART-I (11 th Class)		Roll No: _____	
STATISTICS PAPER-I		MTN-11-23			
TIME ALLOWED: 20 Minutes		OBJECTIVE		MAXIMUM MARKS: 17	
Q.No.1		You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that bubble in front of that question number, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question.			
S.#	QUESTIONS	A	B	C	D
1	In binomial distribution $n = 16$ and $p = \frac{1}{2}$, then variance will be:	2	4	5	6
2	The hypergeometric experiment has properties:	One	Two	Three	Four
3	In plural sense, statistics mean:	Methods	Sample values	Numerical data	Average values
4	A pie chart is represented by:	Square	Circle	Triangle	Rectangle
5	The G.M. of 1, 3, and 27 is:	10	27	10.3	3
6	If $\bar{X} = 10$ and $Y = 2X + 7$, then $\bar{Y} = ?$	27	37	20	17
7	For a set of 20 values, $\sum(X - \bar{X})^2 = 780$, then S.D. will be:	49	7	14	98
8	$Var(aX + b)$ equals to:	$Var(X) + b$	$a Var(X) + b$	$a^2 Var(X)$	$Var(X)$
9	The median of data $-2, 0, 2, 5, -1$ is:	-2	2	5	0
10	For a normal distribution, $\bar{X} \pm 3S$ include of the observations:	99.73%	95.45%	88.27%	68.27%
11	Simple aggregate index number is given by:	$\frac{\sum P_0}{\sum P_n} \times 100$	$\frac{P_n}{P_0} \times 100$	$\frac{\sum P_n}{\sum P_0} \times 100$	$\frac{P_0}{P_n} \times 100$
12	Simple index number involves commodity:	Four	Two	Three	One
13	The probability of a black queen from a pack of 52 playing cards is:	$\frac{4}{52}$	$\frac{2}{52}$	$\frac{1}{52}$	$\frac{3}{52}$
14	If $P(A) = 0.4$, $P(B) = 0.5$, $P(A \cap B) = 0.2$ then $P(A \cup B) = ?$	0.7	0.8	0.6	0.5
15	For a discrete random variable X , $\sum P(x)$ is always equal to:	0	1	2	3
16	If $Var(X) = 10$ and $Var(Y) = 20$, then $Var(X - Y) = ?$	-10	20	10	30
17	The hypergeometric distribution has parameters:	One	Two	Three	Four

STATISTICS PAPER-I

TIME ALLOWED: 2.40 Hours

SUBJECTIVE

MAXIMUM MARKS: 68

NOTE: Write same question number and its parts number on answer book, as given in the question paper.

SECTION-I MTN-11-23

2. Attempt any eight parts.

8 × 2 = 16

- (i) Distinguish between the terms population and sample. (ii) Narrate any two sources of collecting primary data.
- (iii) Explain the term weighted mean with formula. (iv) Write down the names of any four positional averages.
- (v) Describe the empirical relation between mean, median and mode, for moderately skewed distribution.
- (vi) Given that $X_1 = 3$ and $X_2 = 27$. Show that G.M > H.M.
- (vii) Find the modal letter of the word "PAKISTAN".
- (viii) Given that $U = \frac{X-98}{5}$, $\sum fU = -30$ and $\sum f = 30$. Find \bar{X} .
- (ix) Explain the concept of unweighted index number.
- (x) Define Laspeyre's price index number with formula.
- (xi) Given that $\sum p_1q_1 = 1400$, $\sum p_2q_2 = 1600$, $\sum p_0q_1 = 1360$ and $\sum p_0q_2$. Compute Paasche's price index numbers.
- (xii) If link relatives are 100, 102, 113 and 118. Find chain indices.

3. Attempt any eight parts.

8 × 2 = 16

- (i) What is main idea of classification? (ii) Distinguish between class limits and class boundaries.
- (iii) Enlist the types of dispersion. (iv) Outline any two properties of S.D.
- (v) How would you explain the concept of Kurtosis if $b_2 > 3$, $b_2 = 3$ and $b_2 < 3$?
- (vi) Find b_1 , if $m_2 = 5.2$ and $m_3 = -0.8$ (vii) The first two moments about 4 are 1 and 16. Find variance.
- (viii) Is variance affected by change of origin and scale?
- (ix) Describe the main idea of calculating probability of an event.
- (x) Distinguish between sample space and sample point. (xi) What is the range of probability of an event?
- (xii) Two cards are drawn without replacement from 52 playing cards. What is the probability that both are aces?

4. Attempt any six parts.

6 × 2 = 12

- (i) Define probability distribution. (ii) Explain the application of random numbers.
- (iii) Given $f(x) = \frac{k}{x}$, $x = 1, 2, 3$. Find k . (iv) Given $E(X) = 200$ and $S.D(X) = 5$. Find $E(X^2)$
- (v) What are the parameters of a binomial distribution?
- (vi) A random variable X has following binomial distribution with $n = 5$ and $p = 0.2$. Find $P(X = 2)$
- (vii) In a binomial distribution, mean = 2.4 and standard deviation = 1.2. Find the value of n .
- (viii) Define hypergeometric experiment.
- (ix) For hypergeometric distribution $N = 10$, $n = 4$ and $K = 5$. Find $P(X = 0)$

SECTION-II

NOTE: Attempt any three questions.

3 × 8 = 24

- 5.(a) The average wage of 4 men is Rs.17 per hour. What is the average wage of further 6 men if the average wage of all 10 men is Rs.20 per hour. 4

- (b) Compute G.M of the data 4

Age	11-20	21-30	31-40	41-50	51-60	61-70
f	12	14	26	35	23	5

- 6.(a) Find semi-inter quartile range for the data given below: 4

Ages	20	30	40	50	60
f	3	61	132	51	2

- (b) Given the first four moments about $Y = 20$ are as $-2, 15, -25$ and 80 respectively. Calculate b_2 . 4

- 7.(a) Compute: (i) Base year Weighted Index Number (ii) Current year Weighted Index Number from the given data by taking 1980 as base year. 4

Commodities	Prices		Quantities	
	1980	1981	1980	1981
A	10	12	20	22
B	8	8	16	18
C	5	6	10	11
D	4	5	7	8

- (b) A bag consists of 3 white and 5 red balls. If two balls are drawn at random, what is the probability that: 4
(i) Both are white (ii) Both are of same colour

- 8.(a) A random variable 'X' has the following probabilities distribution: 4

X	1	2	3
$P(x)$	$\frac{6}{9}$	$\frac{2}{9}$	$\frac{1}{9}$

Find Mean and Standard Deviation of x .

- (b) A continuous random variable 'X' can assume values between $X = 2$ and $X = 5$ and has a density function $f_x = \frac{2(1+X)}{27}$ (i) $P(3 < x < 4)$ (ii) $P(X \leq 4)$ 4

- 9.(a) Let 'X' be a random variable having binomial distribution with parameters $n = 5$ and $p = 0.52$ Calculate (i) $P(X = -2)$ (ii) $P(X = 2)$ (iii) $P(X = 2.5)$ (iv) $P(X > 5)$ 4

- (b) A committee of size "3" is to be selected at random from 4 women and 6 men. Obtain the probability distribution of number of men in the committee. 4

STATISTICS PAPER-I

TIME ALLOWED: 20 Minutes
MAXIMUM MARKS: 17

OBJECTIVE

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 bubble in front of that question number, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question. No credit will be awarded in case BUBBLES are not filled. Do not solve question on this sheet of OBJECTIVE PAPER.

Q.No.1

- (1) An expected value of a random variable is equals to:
 (A) Variance (B) Standard deviation (C) Mean (D) Coefficient of variation
- (2) If $E(x) = 2$, $E(x^2) = 6$ then $\text{var}(X)$ is:
 (A) 2 (B) 6 (C) 4 (D) 1
- (3) In a binomial distribution the successive trials are:
 (A) Dependent (B) Independent (C) Infinite (D) None of these
- (4) In a hypergeometric distribution, $N = 10$, $n = 2$, $K = 3$ then its mean is:
 (A) 0 (B) 0.2 (C) 0.4 (D) 0.6
- (5) The purpose of the sample is to draw inference about:
 (A) Sample (B) Population (C) Constant (D) Array
- (6) If there are no gaps between upper and lower value of next class, such classes are called:
 (A) Mid points (B) Class limits (C) Class marks (D) Class boundaries
- (7) A graph of time series is called:
 (A) Pie chart (B) Histogram (C) Histogram (D) Frequency polygon
- (8) The most repeated value in a set of data is called:
 (A) Arithmetic mean (B) Median (C) Mode (D) Geometric mean
- (9) If $\sum(X - 15) = 10$, $\sum(X - 25) = 0$, then Arithmetic Mean is:
 (A) 15 (B) 10 (C) 25 (D) 0
- (10) Which one is correct?
 (A) $A.M \geq G.M \geq H.M$ (B) $H.M \geq G.M \geq A.M$
 (C) $G.M \geq H.M \geq A.M$ (D) $A.M \geq H.M \geq G.M$
- (11) If $Q_3 = 20$ and $Q_1 = 10$, then quartile deviation is:
 (A) 0 (B) 5 (C) 10 (D) 20
- (12) The mean deviation is minimum when deviations are taken from:
 (A) Zero (B) Mode (C) Mean (D) Median
- (13) Which one is correct for symmetrical distribution?
 (A) Mean > Mode (B) Mean > Median (C) Median > Mode (D) Mean = Mode
- (14) In chain base method the base period is:
 (A) Fixed (B) Changed (C) Both A and B (D) None of these
- (15) Base year quantities are used as weights for:
 (A) Laspeyre's Price Index (B) Paasche's Price Index (C) Fisher's Price Index (D) None of these
- (16) The probability of sample space "S" is:
 (A) Zero (B) One (C) Two (D) Three
- (17) 5C_4 is equals to:
 (A) 5 (B) 20 (C) 100 (D) 120

INTERMEDIATE PART-I (11th CLASS)

STATISTICS PAPER-I

TIME ALLOWED: 2.40 Hours

MAXIMUM MARKS: 68

SUBJECTIVE

NOTE: Write same question number and its part number on answer book, as given in the question paper.

SECTION-I

2. Attempt any eight parts. 8 × 2 = 16

- (i) How is the term constant defined?
- (ii) Expand the summation sign (a) $\sum_{i=1}^5 y_i$ (b) $\sum_{i=5}^8 (y_i - u)$
- (iii) Find the mean and the sum of first n natural number.
- (iv) If $\bar{x} = 20$ and $y = 5x + 10$, then find \bar{y} .
- (v) Calculate G.M of 1, 1, 8.
- (vi) What are the two merits of median?
- (vii) Define mode with example.
- (viii) If $X_1 = 2$ and $X_2 = 8$. Show that A.M > G.M > H.M.
- (ix) Define simple and composite index number.
- (x) What are the two shortcomings of index number?
- (xi) If $\sum p_1 q_0 = 31237$, $\sum p_0 q_0 = 29025$, Paasche's index number is 104.87. Find Fisher's Index Number.

3. Attempt any eight parts. 8 × 2 = 16

- (i) Define Relative frequency.
- (ii) Enlist the main parts of a table.
- (iii) Define Mean Deviation.
- (iv) Given mean = 200, C.V = 7. Find the value of Variance.
- (v) What are the types of dispersion?
- (vi) Given that $Q_3 = 178.25$ and $Q.D = 53.725$ then find the value of Q_1 .
- (vii) If $S_K = 0.32$, mean = 29.6, and mode = 24.8. Find the value of S.D.
- (viii) Draw the shape of the curve for the Meso-kurtic, Platy-kurtic and Lepto-kurtic distributions.
- (ix) Define set and subset.
- (x) What do you understand by Random experiment?
- (xi) Define conditional probability.
- (xii) Given $P(A) = 0.6$, $P(B) = 0.5$, $P(A \cup B) = 0.9$ then find (a) $P\left(\frac{A}{B}\right) = ?$ (b) $P(A \cap B) = ?$

4. Attempt any six parts. 6 × 2 = 12

- (i) Given $x = 2, 4, 6$ and $p(x) = \frac{2}{6}, \frac{2}{6}, \frac{2}{6}$ compute $E(x)$.
- (ii) What is a random experiment? Also give an example.
- (iii) Describe any two properties of Mathematical Expectation.
- (iv) If $\text{Var}(x) = 3$, compute $\text{Var}(2.x)$
- (v) Given that $E(X) = 200$ and C.V = 7%. Find $\text{Var}(x)$.
- (vi) In a Binomial distribution if, $n = 5$, $q = \frac{1}{2}$. Find $P(x = 4)$.
- (vii) Is it possible that in a binomial distribution, Mean = 6 and variance = 7?
- (viii) In a hypergeometric distribution if, $n = 5$, $k = 4$, $N = 11$ then compute its mean and variance.
- (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.**

- 5.(a) The following table gives the marks obtained by a batch of 5 candidates in an examination in History, Statistics and Economics: 4

Roll No.	History	Statistics	Economics
1	41	46	50
2	35	50	52
3	38	39	41
4	34	30	46
5	30	38	39

In which subject level of knowledge is highest?

- (b) Find harmonic mean for the following data: 4

x	12	14	16	18	20	22
f	1	4	6	10	7	2

- 6.(a) Find the co-efficient of Quartile deviation from the data given below: 4

Classes	25 – 50	50 – 75	75 – 100	100 – 125	125 – 150	150 – 175
f	10	12	16	17	20	18

- (b) From the given data: 2, 5, 6, 6, 8, 9, 12, 13, 16, 23 compute the mean deviation from
(a) Mean (ii) Median 4

- 7.(a) Compute the chain indices by using mean as an average from the following prices of three items: 4

Year	A	B	C
2010	82	78	120
2011	63	55	129
2012	105	88	112
2013	94	76	166

- (b) Three coins are tossed simultaneously. Find the probability of occurring
(a) No head (b) 1 head (c) 2 head 4

- 8.(a) A continuous random variable 'X' that can assume values between 2 and 5 has a density function 4

given by $f(x) = \frac{2(1+x)}{27}$ find (a) $P(x \leq 4)$ (b) $P(3 \leq x \leq 4)$

- (b) Given a random variable 'X' with $E(x) = 0.63$ and $\text{Var}(x) = 0.2331$
Find (i) $E(x^2)$ (ii) C.V. (x) 4

- 9.(a) If 'X' is the number of successes with probability of success $\frac{1}{4}$ in each of 5 independent trials.
Find (i) $P(X = 0)$ (ii) $P(X \leq 2)$ 4

- (b) A committee of size 5 is to be selected at random from 3 women and 5 men.
Find the expected number of women on the committee. 4

STATISTICS PAPER-I

TIME ALLOWED: 20 Minutes

OBJECTIVE

MAXIMUM MARKS: 17

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 bubble in front of that question number, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question. No credit will be awarded in case BUBBLES are not filled. Do not solve question on this sheet of OBJECTIVE PAPER.

Q.No.1

- (1) The data obtained by conducting a survey is called:
 (A) Primary data (B) Secondary data (C) Continuous data (D) Grouped data
- (2) The number of values falling in a particular group is called:
 (A) Class frequency (B) Class limit (C) Class mark (D) Class boundary
- (3) For graphic presentation of a frequency distribution, the paper to be used is:
 (A) Carbon paper (B) Ordinary paper (C) Graph paper (D) Butter paper
- (4) Ten families have an average of 2 boys. How many boys do they have together?
 (A) 2 (B) 10 (C) 12 (D) 20
- (5) The appropriate average for calculating the average speed of a journey is:
 (A) Median (B) Mode (C) Arithmetic mean (D) Harmonic mean
- (6) The modal letter of the word "STATISTICS" is:
 (A) S (B) T (C) Both S and I (D) Both S and T
- (7) Which of the following is an absolute measure of dispersion?
 (A) Coefficient of variation (B) Coefficient of dispersion
 (C) Standard deviation (D) Coefficient of skewness
- (8) If $Y = X \pm 6$, then S.D(Y) is equal to:
 (A) $S.D(X) + 6$ (B) $S.D(X) - 6$ (C) $S.D(X)$ (D) $S.D(X) + S.D(Y)$
- (9) Departure from symmetry is called:
 (A) Variation (B) Skewness (C) Kurtosis (D) Dispersion
- (10) In price relatives, the given year price is divided by the price of:
 (A) First year (B) Last year (C) Base year (D) Preceding year
- (11) Consumer price index numbers are obtained by:
 (A) Paasche's formula (B) Laspeyre's formula (C) Fisher's formula (D) Newton's formula
- (12) An arrangement of objects without regarding the order is called:
 (A) Permutation (B) Combination (C) Sample point (D) Experiment
- (13) Given $P(A) = \frac{2}{3}$, $P(B) = \frac{3}{8}$ and $P(A \cap B) = \frac{1}{4}$, then A and B are:
 (A) Independent (B) Dependent (C) Mutually exclusive (D) Equally likely
- (14) A discrete probability distribution may be represented by:
 (A) Table (B) Graph (C) Mathematical equation (D) All of these
- (15) If X is a continuous random variable, then $P(X = 1)$ is equal to:
 (A) Zero (B) One (C) Negative (D) Positive
- (16) In binomial probability distribution if $n = 3$, then $P(X > 3)$ is equal to:
 (A) Less than zero (B) Zero (C) One (D) Greater than one
- (17) The mean of the hypergeometric distribution is:
 (A) $\frac{nN}{K}$ (B) $\frac{n+K}{N}$ (C) $\frac{nK}{N}$ (D) $\frac{NK}{n}$

INTERMEDIATE PART-I (11th CLASS)**STATISTICS PAPER-I**

TIME ALLOWED: 2.40 Hours

SUBJECTIVE

MAXIMUM MARKS: 68

NOTE: Write same question number and its part number on answer book, as given in the question paper.

SECTION-I

2. Attempt any eight parts.

8 × 2 = 16

- (i) Define Statistics.
- (ii) What are the types of quantitative variable?
- (iii) Write any two advantages of Median.
- (iv) Why an average is called measure of central tendency?
- (v) Define percentile and write the formula of 65th percentile.
- (vi) For a certain distribution, if $\sum(x - 15) = 5$ and $\sum(x - 18) = 0$, what is the value of arithmetic mean and why?
- (vii) Find the geometric mean of 1, 2, 32.
- (viii) Define harmonic mean. Also write its formula.
- (ix) Write any two uses of index numbers.
- (x) How do you define market basket?
- (xi) Given $\sum p_1 q_0 = 1250$ and $\sum p_0 q_0 = 1200$, find the base year weighted index number.
- (xii) Define base period.

3. Attempt any eight parts.

8 × 2 = 16

- (i) How can you differentiate between grouped and ungrouped data?
- (ii) What is Histogram?
- (iii) What is the S.D of 4, 4, 4, 4? Explain.
- (iv) Define variance. Also write its formula by definition.
- (v) Is it possible that 1st moment about mean is 10? Justify your answer.
- (vi) If $Q_1 = 20$ and $Q_3 = 60$, then find coefficient of Q.D.
- (vii) What is relative measure of dispersion?
- (viii) Write any two properties of variance.
- (ix) Distinguish between permutations and combinations.
- (x) What do you mean by independent events?
- (xi) If a die is rolled, what is the probability of a number divisible by 3?
- (xii) If A and B are independent events and $P(A) = 0.4$, $P(B) = 0.3$. Find $P(A \cap B)$.

4. Attempt any six parts.

6 × 2 = 12

- (i) How can random numbers be generated?
- (ii) How many types of random variable are?
- (iii) Explain the laws of expectation.
- (iv) A die is rolled if $x =$ face value, then find $E(X)$.
- (v) Explain the properties of probability density function.
- (vi) Define binomial experiment.
- (vii) What are the parameters of a binomial distribution?
- (viii) Define hypergeometric distribution.
- (ix) If X is a hypergeometric random variable with $N = 40$, $n = 5$ and $k = 4$. Find the value of mean.

SECTION-II

NOTE: Attempt any three questions.

5.(a) Find Geometric Mean for the following data: 4

x	6	10	14	16	20
f	2	5	8	3	2

(b) Find Median and Mode for the following distribution: 4

Classes	9.3 – 9.7	9.8 – 10.2	10.3 – 10.7
f	3	7	2

6.(a) Compute mean deviation about mean. 4

C.I	86 – 90	91 – 95	96 – 100	101 – 105	106 – 110
f	6	4	10	6	3

(b) The weights of 38 male students at a university are given in the following frequency table: 4

Weight	118 – 126	127 – 135	136 – 144	145 – 153	154 – 162
f	3	5	9	12	4

Calculate Bowley's co-efficient of Skewness.

7.(a) The following figure give the average annual prices for beef and mutton. Construct index number of meat prices giving weights 2 and 1 for beef and mutton respectively. Take the year 2016 as base: 4

Year	2016	2017	2018	2019	2020	2021
Beef	350	400	450	450	500	600
Mutton	750	800	1000	1100	1200	1250

(b) Assume that X is a number chosen at random from the set of integers between 1 and 14 both inclusive. What is probability if: 4

- (i) X is a single digit number
- (ii) X is a multiple of 5 or 6

8.(a) For the probability distribution of ' X ' given below. Find that: 4

- (i) $E(X)$
- (ii) $E(X^2)$

x	0	1	2	3
$P(x)$	$\frac{3}{10}$	$\frac{4}{10}$	$\frac{2}{10}$	$\frac{1}{10}$

(b) A committee of size 5 is to be selected from 3 female and 5 male members. Find expected number of female members on the committee. 4

9.(a) In a binomial distribution the mean and S.D are 36 and 4.8 respectively. Find its parameters. 4

(b) There are 7 people who work in an office 4 of these would like to be transferred. If 3 of these are selected randomly for transfer. What is the probability that: 4

- (i) All three will want to be transferred
- (ii) Two of these will want to be transferred