

Multan Board-2023

Paper Code Number: 2183		2023 (1 st -A) INTERMEDIATE PART-I (11 th Class)		Roll No: _____	
STATISTICS PAPER-I					
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

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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 (NEW SCHEME)

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. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question. Attempt as many questions as given in objective type question paper and leave others blank. No credit will be awarded in case BUBBLES are not filled. Do not solve questions on this sheet of OBJECTIVE PAPER.

Q.No.1

- (1) Methods of organizing, summarizing and presenting data in an informative way is called:
(A) Descriptive Statistics (B) Inferential Statistics (C) Applied Statistics (D) All these
- (2) Frequency distribution is often constructed with the help of:
(A) Entry table (B) Tally sheet (C) Both A and B (D) Neither A nor B
- (3) A pie diagram is represented by a:
(A) Rectangle (B) Circle (C) Triangle (D) Square
- (4) The sample mean \bar{X} is calculated by the formula:
(A) $\frac{\sum f x}{\sum f}$ (B) $A + \frac{\sum f D}{\sum f}$ (C) $A + \frac{\sum f U}{\sum f} \times h$ (D) All these
- (5) Which of the following statements is always correct for symmetric distribution?
(A) Mean = Median = Mode (B) Arithmetic mean = Geometric mean = Harmonic mean
(C) Median = $Q_2 = D_4 = P_{50}$ (D) Mode = 2 Median - 3 Mean
- (6) The averages are effected by change of:
(A) Origin (B) Scale (C) Both A and B (D) None of these
- (7) Given $X_1 = 20$ and $X_2 = -20$ the arithmetic mean will be:
(A) Zero (B) Infinity (C) Impossible (D) Difficult to tell
- (8) If $Y = ax \pm b$, where a and b are any two numbers but $a \neq 0$, then $M.D(Y)$ is equal to:
(A) $M.D(X)$ (B) $M.D(X) \pm b$ (C) $|a| M.D(X)$ (D) $M.D(Y) + M.D(X)$
- (9) If the maximum value in a series is 25 and its range is 15, the minimum value of the series is:
(A) 10 (B) 15 (C) 25 (D) 35
- (10) In chain base method, base period is:
(A) Fixed (B) Not fixed (C) Constant (D) Zero
- (11) Consumer price index are obtained by: (A) Paasche's formula
(B) Fisher's ideal formula (C) Marshall Edge Worth formula (D) Family budget method formula
- (12) Two coins are tossed. Probability of getting head on the first coin is:
(A) $\frac{2}{4}$ (B) 1 (C) Zero (D) 4
- (13) Given of $P(\bar{A} \cap \bar{B}) = \frac{3}{10}$ then $P(A \cup B)$ is: (A) $\frac{7}{10}$ (B) $\frac{1}{10}$ (C) $\frac{3}{10}$ (D) 1
- (14) $E[X - E(X)]^2$ is: (A) $E(X)$ (B) $E(X^2)$ (C) $Var(X)$ (D) $S.D(X)$
- (15) A variable which can assume finite or countably infinite number of values, is known as:
(A) Continuous Variable (B) Discrete Variable (C) Qualitative Variable (D) None of these
- (16) In a binomial experiment the successive trials are:
(A) Dependent (B) Independent (C) Mutually exclusive (D) Fixed
- (17) In a Hypergeometric distribution $N = 6$, $n = 4$ and $K = 3$ then the mean is equal to:
(A) 2 (B) 4 (C) 6 (D) 24

SECTION-I

2. Attempt any eight parts.

8 × 2 = 16

- (i) What are the difference between Parameter and Statistic?
- (ii) Define Discrete and Continuous Variable.
- (iii) Define Average.
- (iv) What is the difference between Simple Arithmetic mean and Weighted mean?
- (v) Find mode of the letter STATISTICS.
- (vi) Write down two merits and two de-merits of Harmonic Mean.
- (vii) For $n = 2$ if H.M = 10, G.M = 12 find A.M.
- (viii) What is Composite Index Number?
- (ix) Define Fisher's Ideal Index Number.
- (x) What are the purpose of Index Number.
- (xi) Define Simple Index Number.
- (xii) If $\sum p_0 q_1 = 850$ and $\sum p_1 q_1 = 1210$. Find current year weighted index.

3. Attempt any eight parts.

8 × 2 = 16

- (i) Define Relative Frequency.
- (ii) Define Histogram.
- (iii) Explain the meaning of term "dispersion".
- (iv) Enlist various relative measures of dispersion.
- (v) Define Moments Ratios.
- (vi) Given $Var(X) = 25$, find $Var(2X + 4)$
- (vii) Can mean, median and mode be same, if yes, state in what situation?
- (viii) If first three moments about $X = 20$ of a distribution are: 1, 4, 10, then find the value of " b_1 ".
- (ix) Explain the term "Random experiment" with an example.
- (x) Explain the concept of equally likely events with an example.
- (xi) Define Conditional Probability.
- (xii) If $P(A) = \frac{1}{3}$, $P(B) = \frac{1}{4}$ and $P(A/B) = \frac{1}{6}$, then find $P(B/A)$

4. Attempt any six parts.

6 × 2 = 12

- (i) Write down two properties of Probability Mass Function.
- (ii) What does p.d.f. stands for?
- (iii) Given $X = 2, 4, 6$ and $P(X) = \frac{2}{6}, \frac{2}{6}, \frac{2}{6}$ find $E(X^2)$
- (iv) Define Expectation.
- (v) Explain Discrete Probability Distribution
- (vi) Write down two properties of Hypergeometric Experiment.
- (vii) Write down the formula of Hypergeometric Distribution.
- (viii) What will be the mean and variance of binomial distribution if $n = 6$ and $p = 0.6$?
- (ix) Explain Binomial Random Experiment.

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(2)

SECTION-II

NOTE: - Attempt any three questions.

5.(a) Reciprocals of X values are given below:

0.0267, 0.0235, 0.0211, 0.0191, 0.0174 Calculate Harmonic Mean of values.

4

(b) Find Geometric Mean of 50, 67, 39, 40, 36, 60, 54.

4

6.(a) Calculate mean deviation.

4

y_i	22	27	32	37	42	47
f	1	4	8	15	9	2

(b) For a group of 50 boys, mean score and standard deviation on a test are 59.5 and 8.38 respectively, for a group of 40 girls, the mean and standard deviation are 54.0 and 8.23 respectively on the same test. Find standard deviation for combined group of 90 students.

4

7.(a) An inquiry into the budgets of the middle class families in England gave the following information. What changes in cost of living figures of 1929 show as compared to 1928?

4

Expenses on	Food 35 %	Rent 15 %	Clothing 20 %	Fuel 10 %	Misc. 20 %
Price (1928)	150	30	75	25	40
Price (1929)	145	30	65	23	45

(b) In rolling two dice once, what is the probability that "sum of dots is either 9 or 11?"

4

8.(a) A continuous random variable ' X ' has probability density function: $f(x) = cx$; $0 < x < 2$
Determine (i) c , (ii) $P(x < 1.5)$

4

(b) Let ' X ' be a random variable with probability distribution as:

4

x	0	1	2	3	4
$f(x)$	0.125	0.45	0.25	0.05	0.125

Find its mean and variance.

9.(a) Find mean and variance of binomial probability distribution if $n = 2$ and $q = \frac{1}{3}$ after making complete binomial probability distribution.

4

(b) Find mean of hypergeometric random variable if $n = 6$, $k = 4$ and $N = 10$ after making complete probability distribution of it.

4

39-2019(A)-3200 (MULTAN)

INTERMEDIATE PART-I (11TH CLASS)

STATISTICS PAPER-I (New Scheme)



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. Attempt as many questions as given in objective type question paper and leave others blank. 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 middle value of an ordered series is called:
(A) Median (B) 5th decile (C) 50th percentile (D) All these
- (2) If the values of Mean, Median and Mode coincide in a uni-Model distribution, then the distribution will be:
(A) Skewed to the left (B) Skewed to the right (C) Multi Model (D) Symmetrical
- (3) The Geometric-Mean for x_1 and x_2 is:
(A) $\sqrt{x_1 + x_2}$ (B) $\sqrt{x_1 x_2}$ (C) $\sqrt{x_1} + \sqrt{x_2}$ (D) $\sqrt{2x_1 x_2}$
- (4) _____ is expressed in the same units as the units of the observation.
(A) Variance (B) Standard deviation (C) Co-efficient of variation (D) Co-efficient of Range
- (5) The first three moments of a distribution about the mean \bar{x} are 0, 4 and 0. The distribution is:
(A) Symmetrical (B) Skewed to the right (C) Skewed to the left (D) Lepto Kurtic
- (6) In a Mesokurtic distribution:
(A) $\beta_1 = 0$ and $\beta_2 = 3$ (B) $\beta_1 = 3$ and $\beta_2 = 0$ (C) $\beta_1 = 0$ and $\beta_2 > 3$ (D) $\beta_1 = 0$ and $\beta_2 < 3$
- (7) In chain base Method, base period is:
(A) Fixed (B) Not fixed (C) Constant (D) Zero
- (8) Index number for the base period is always taken as:
(A) 100 (B) One (C) 200 (D) Zero
- (9) The probability of an event cannot be:
(A) Equal to zero (B) Between Zero and One (C) Equal to one (D) Less than zero
- (10) An arrangement of the objects without regard to their order is called:
(A) Permutation (B) Combination (C) Random experiment (D) Sample point
- (11) $E[x - E(x)]^2$ is :
(A) $E(x)$ (B) $E(x^2)$ (C) $\text{Var}(x)$ (D) S.D (x)
- (12) A discrete probability function $f(x)$ is always non-negative and always lies between:
(A) 0 and ∞ (infinity) (B) 0 and 1 (C) -1 and +1 (D) $-\infty$ to $+\infty$ (infinity)
- (13) The parameters of the binomial distribution are:
(A) n and P (B) P and q (C) nP and nq (D) nP and npq
- (14) The mean of the Hypergeometric distribution is:
(A) $\frac{nK}{N}$ (B) $\frac{NK}{n}$ (C) $\frac{Nn}{K}$ (D) $\frac{n+K}{N}$
- (15) A variable that assumes any value within a range is called:
(A) Discrete variable (B) Continuous variable (C) Independent variable (D) Dependant variable
- (16) The average of lower and upper class limits is:
(A) Class boundary (B) Class frequency (C) Class marks (D) Class limits
- (17) A pie-diagram is represented by:
(A) Rectangle (B) Circle (C) Triangle (D) Square