

Sargodha Board-2023

1123 Warning:- Please write your Roll No. in the space provided and sign. Roll No-----
Statistics (Objective) (Session 2019-21 to 2022-24) Sig. of Student -----
(Inter Part – I) Paper (I)

Time Allowed:- 20 minutes

PAPER CODE 2181

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 circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question. Write PAPER CODE, which is printed on this question paper, on the both sides of the Answer Sheet and fill bubbles accordingly, otherwise the student will be responsible for the situation. Use of Ink Remover or white correcting fluid is not allowed.

Q. 1

- 1) A constant can assume
(A) One value (B) Different values (C) More than one values (D) None of all
- 2) Row caption is called
(A) Title (B) Body (C) Box head (D) Stub
- 3) The Model Letter(s) of the word STATISTICS.
(A) S (B) T (C) S & T (D) None of all
- 4) If a distribution has $\bar{X} = \tilde{X} = \hat{X}$, then it is called.
(A) +vely skewed (B) -vely skewed (C) Symmetrical (D) None of all
- 5) Median divides the ordered data into -----equal parts.
(A) 2 (B) 3 (C) 4 (D) 5
- 6) The first moment about mean is
(A) One (B) Variance (C) S.D (D) Zero
- 7) The degree of Peakedness is called
(A) Dispersion (B) Skewness (C) Kurtosis (D) Symmetry
- 8) $\frac{Q_3 - Q_1}{2}$ is called.
(A) Interquartile range (B) Semi Interquartile Range (C) Variance (D) S.D
- 9) The Index $\frac{\sum p_n q_o}{\sum p_o q_o} \times 100$ is
(A) Laspeyre's Index No (B) Paasche's Index No (C) Fisher Index No (D) Value Index
- 10) Fisher Index No is----- of Laspeyre's and Paasche's Index Nos.
(A) A.M (B) GM (C) Median (D) Mode
- 11) If $A \cap B = \phi$, then A & B events are called
(A) Equally likely (B) Exhaustive (C) Mutually Exclusive (D) None of all
- 12) The probability of an event cannot be
(A) = 0 (B) < 0 (C) > 0 (D) = 1
- 13) Expected value of a constant is always
(A) Zero (B) One (C) Two (D) Constant itself
- 14) A r.v. that can assume its value only in whole numbers is called.
(A) Continuous Variable (B) Discrete Variable (C) Qualitative Variable (D) None of these
- 15) Probability of success remains constant in
(A) Binomial distribution (B) Poisson distribution (C) Hypergeometric distribution (D) None of these
- 16) Hypergeometric distribution deals with.
(A) Independent trials (B) Dependent trials (C) Both a and b (D) None of all
- 17) Variance of Binomial distribution is
(A) np (B) \sqrt{npq} (C) npq (D) npk

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1123 Warning:- Please, do not write anything on this question paper except your Roll No.
Statistics (Subjective) (Session 2019-21 to 2022-24) Paper (I)

Time Allowed: 2.40 hours

(Inter Part - I) Maximum Marks: 68

Section ----- I

2. Answer briefly any Eight parts from the followings:-

8 × 2 = 16

- (i) Define Statistics in Plural Sense.
- (ii) What is Primary data?
- (iii) Write down Some advantages of median.
- (iv) Give three dis-advantages of H.M
- (v) Define Median.
- (vi) Find Mode of 3, 3, 7, 8, 10, 11, 10, 12, 3
- (vii) Define Harmonic Mean.
- (viii) Define Weighted mean.
- (ix) If Laspeyre's I.No=105.4 and Paache's I.No =103.2 Find Fisher's I.No.
- (x) What is Composite index number?
- (xi) Given: $\sum p_1 q_0 = 900$ and $\sum p_0 q_0 = 897$. Find Cost of Living Index No.
- (xii) Define Paache's Index.

3. Answer briefly any Eight parts from the followings:-

8 × 2 = 16

- (i) What is an "Ogive"?
- (ii) What does "Data" means?
- (iii) Define variance.
- (iv) Define Range.
- (v) Define Skewness.
- (vi) Define Kurtosis.
- (vii) The first two moments about the value 2 are 1 and 16. Compute Mean and Variance.
- (viii) Define compound events.
- (ix) What is the Mathematical definition of probability?
- (x) Define an impossible event. Also give an example.
- (xi) Define Sure event. Also give an example.
- (xii) If $P(A)=0.35$. What will be the value of $P(\bar{A})$?

4. Answer briefly any Six parts from the followings:-

6 × 2 = 12

- (i) Define probability mass function.
- (ii) What are properties of probability distribution?
- (iii) check whether $f(y) = \frac{1}{y}$ for $y = 1, 2, 3, 4$ is a probability function?
- (iv) Given that $E(X^2)=400$, $\text{Var}(X)=144$, find $E(X)$.
- (v) Define hyper-geometric probability distribution.
- (vi) Write properties of binomial experiment.
- (vii) Is it possible to have binomial distribution with mean = 5 and S.D = 4.
- (viii) In a hyper-geometric distribution mean=1.8182, $N=11$, $n=5$, then find K.
- (ix) If $n=6$ and $P=\frac{1}{5}$ in a binomial distribution find $P(X=1)$

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Section ----- II

Note: Attempt any three questions.

(8 × 3 = 24)

5 (a) Find the A.M from the following data.

$u = \frac{x - 30}{5}$	-2	-1	0	1	2	3
f	5	8	15	20	12	04



(b) Find the value of upper Quartile Q_3

Groups	0 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9
f	3	4	9	4

6 (a) Find Mean deviation from mean for the following data.

C.I	86 - 90	91 - 95	96 - 100	101 - 105	106 - 110
f	6	4	10	3	1

(b) Calculate variance and standard deviation for the following data: 3, 6, 2, 1, 7 and 5.

7 (a) A household budget inquiry of middle class people in a town gave the following information.

Items	Food	Rent	Clothing	Fuel	Misc
Expense	35%	15%	20%	10%	20%
Price (2003)	150	30	75	25	40
Price (2005)	145	30	65	23	45

Calculate CPI for the year 2005 with 2003 as base year.

(b) Three missiles are fired at a target. If probability of hitting is 0.4, 0.5 and 0.6 respectively.

Assuming missiles are fired independently. What is the probability that:

(i) All hit the target (ii) None hit the target.

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

X	1	2	3	4	5
f(X)	0.125	0.350	0.300	0.125	0.100

Show that $E(3X - 2) = 3E(X) - 2$

(b) A continuous random variable X has a density function.

$$f(X) = \begin{cases} CX & \text{for } 0 < X < 2 \\ 0 & \text{elsewhere} \end{cases}$$

Determine (i) C

(ii) $P(0.5 < X < 1.5)$

9(a) The probability that a patient recovers from a heart operation is 0.9. If 5 patients have heart operation.

Find the probability that (i) 3 will recover. (ii) None will recover.

(b) A machine produced 7 good and 3 defective items. Two items are selected at random without replacement. If X denote the number of defective items, then find.

(i) $P(X = 2)$ (ii) $P(X < 2)$

119 Warning:- Please write your Roll No. in the space provided and sign. Roll No-----
 Statistics (Objective) (Session 2015-17 to 2018-20) Sig. of Student -----
 (Inter Part – I) **Paper (I)**

Time Allowed:- 20 minutes

PAPER CODE 2181

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 circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question. Write PAPER CODE, which is printed on this question paper, on the both sides of the Answer Sheet and fill bubbles accordingly, otherwise the student will be responsible for the situation. Use of Ink Remover or white correcting fluid is not allowed.

Q. 1

- 1) In which sense "Statistics" mean numerical data:-
 (A) Singular (B) Plural (C) Both (a) & (b) (D) None of these
- 2) "Statistics" must be:-
 (A) Comparable (B) Not comparable (C) Discrete in nature (D) Qualitative in nature
- 3) The average of lower and upper class limits is called:-
 (A) Class boundary (B) Class frequency (C) Class mark (D) Class limit
- 4) Geometric mean of the numbers "0,1,2,5,9" is:-
 (A) 2 (B) 5 (C) -5 (D) Not possible
- 5) Mean of a Constant is:-
 (A) Unknown (B) ∞ (C) Constant itself (D) Not possible
- 6) The most suitable average in case of rates and ratio is:-
 (A) G.M (B) A.M (C) H.M (D) Median
- 7) The first moment about mean is:-
 (A) Zero (B) 1 (C) S.D (D) Variance
- 8) Co-efficient of variation is a measure of:-
 (A) Relative Dispersion (B) Skewness (C) Absolute dispersion (D) None of these
- 9) If the dispersion is small, then the standard deviation is:-
 (A) Large (B) Zero (C) Small (D) Negative
- 10) In fixed base method, the base period is:-
 (A) Fixed (B) Constant (C) Not fixed (D) Zero
- 11) The index number for base year is always taken as:-
 (A) 50 (B) 100 (C) 150 (D) 200
- 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) Two coins are tossed, the probability that both faces will be matching is given by:-
 (A) $\frac{2}{4}$ (B) $\frac{1}{4}$ (C) Zero (D) 4
- 14) A discrete probability function, 'f(x)' is always:-
 (A) Non-negative (B) Negative (C) Zero (D) None of these
- 15) In a discrete probability distribution, the sum of all probabilities is always equal to:-
 (A) One (B) Zero (C) 9 (D) -5
- 16) The binomial distribution becomes positively skewed when:-
 (A) $p = 0$ (B) $p > \frac{1}{2}$ (C) $p < \frac{1}{2}$ (D) $p = \frac{1}{2}$
- 17) In Hypergeometric distribution, trials are:-
 (A) Independent (B) Dependent (C) Fixed (D) None of these

1175 -- 1119 -- 2300 (1)

2. Answer briefly any Eight parts from the followings:-

- (i) Define Variable.
- (ii) What is meant by Secondary data?
- (iii) What do you understand by measure of central tendency?
- (iv) Define harmonic mean with its formula.
- (v) In a moderately skewed distribution, Mean = 25 and Mode = 31. Find the value of Median
- (vi) For a frequency distribution of a variable X, it is given that $X = 10 + 5u$, $\Sigma f = 125$, $\Sigma fu = -45$. Find the value of mean.
- (vii) What do you understand by the term 'quantiles'?
- (viii) Define composite index number.
- (ix) Differentiate between un-weighted and weighted index numbers.
- (x) Enlist any four uses of index numbers.
- (xi) If Paasche's index number = 74.76 and Fisher's I.No = 75.76, then find the Laspeyre's I.No.
- (xii) Given $\Sigma W = 20$, and $\Sigma WI = 1800$. Find the cost of living index number by weighted average of Price-relatives method.

3. Answer briefly any Eight parts from the followings:-

8 × 2 = 16

- (i) Define mean deviation.
- (ii) Find quartile deviation and co efficient of quartile deviation of 7.4, 7.4, 7.4, 7.4, 7.4 and 7.4
- (iii) Define platy Kurtic data. Give one example from real life.
- (iv) Define negatively skewed data. Give one example from real life.
- (v) Find Bowley's Coefficient of Skewness if $Q_1 = 84$, $Q_3 = 79$ and median = 81.
- (vi) Define mutually exclusive and exhaustive events.
- (vii) Write 3 properties of random experiment.
- (viii) Give one simple example of independent events.
- (ix) What is probability of a double six when 2 dice are rolled?
- (x) Define Coefficient of Kurtosis i.e ; β_2
- (xi) Give 3 examples of tabular presentation.
- (xii) Which graph can be made from quantitative data, name any three graphs?

4. Answer briefly any Six parts from the followings:-

6 × 2 = 12

- (i) Define Continuous random variable.
- (ii) Define Probability density function.
- (iii) What are the properties of probability distribution?
- (iv) Find K for the probability distribution

x	0	1	2
P(x)	3 K	2 K	K

- (v) Find E(X) when Var(X) = 4, $E(X^2) = 20$
- (vi) Define Binomial Probability Distribution
- (vii) What are parameters of Binomial Distribution?
- (viii) Define Hypergeometric Experiment.
- (ix) If N = 10, n = 5, K = 3 Find mean of Hypergeometric Distribution by using formula of mean.

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Section ----- II

Note: Attempt any three questions.

(8 × 3 =

5 (a) Find geometric mean for the distribution.

Weights	100 – 104	105 – 109	110 – 114	115 – 119	120 – 124
Frequency	24	30	45	65	72

(b) Calculate the arithmetic mean for the following data.

Marks	10 – 19	20 – 29	30 – 39	40 – 49	50 – 59
No- of Students	5	25	40	20	10

6 (a) Calculate Standard deviation using arithmetic mean and also using provisional mean (23).
 $X = 16, 18, 25, 23, 29, 30, 35, 40, 43, 50$

(b) Given the following information

$$\sum f = 290, \sum fx = 2610, \sum fx^2 = 23780, \sum fx^3 = 219530, \sum fx^4 = 2056100$$

Calculate first four moments about the arithmetic mean.

7 (a) Find the Index number of prices from the following data taking 1970 as a base period.

Years:	1970,	1971,	1972,	1973
Prices:	15,	19,	20,	30

(b) From a pack of 52 Cards a Card is drawn. Find the probability that drawn card is
(i) a picture card, (ii) a red card

8 (a) A continuous random variable has a probability density function:

$$f(x) = a(x + 3); \quad 2 \leq x \leq 8$$

$$= 0 \quad ; \text{ elsewhere}$$

Find (i) a (ii) $p(x \leq 6)$

(b) Given that $E(X^2) = 400$

$$SD(X) = 12$$

Find $E(X)$ and c.v.

9(a) If 20% of the items produced by a machine are defective. Determine the probability that Chosen at random (i) 3 items are defective (ii) at least 4 items are defective.

(b) If X has Hypergeometric distribution with $n = 4, N = 10$ and $K = 5$ then Find

(i) $P(X \leq 1)$ (ii) $P(X \geq 3)$

Time Allowed:- 20 minutes

PAPER CODE 2181

Maximum Marks:- 17

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Q. 1

- 1) Eye colour is a
 (A) Constant (B) Continuous variable (C) Qualitative variable (D) Quantitative variable
- 2) The process of arranging data into rows and columns is called.
 (A) Tabulation (B) Classification (C) Frequency distribution (D) Sampling
- 3) The number of values falling in a particular class or category is called
 (A) Relative frequency (B) Cumulative frequency (C) Class frequency (D) All a, b, c
- 4) The algebraic sum of deviations of observations from their mean is always.
 (A) One (B) Zero (C) Greater than one (D) Less than zero
- 5) The Geometric Mean is impossible if any of the observations is
 (A) Negative (B) Greater than one (C) One (D) Fractional
- 6) If "c" is any Constant, then variance of "c" is
 (A) c (B) c^2 (C) Zero (D) One
- 7) The Mean Deviation is least if deviations are taken from
 (A) Mean (B) GM (C) Mode (D) Median
- 8) For a Leptokurtic distribution the moment ratio
 (A) $b_2 > 3$ (B) $b_2 < 3$ (C) $b_2 = 3$ (D) $b_2 = 0$
- 9) The most suitable average in chain indices is
 (A) Median (B) A.M (C) G.M (D) H.M
- 10) Fisher's price Index number is
 (A) $\sqrt{\text{Paasche} \times \text{Laspeyre}}$ (B) $\text{Paasche} + \text{Laspeyre}$ (C) $\text{Paasche} \times \text{Laspeyre}$ (D) $\sqrt{\text{Paasche} + \text{Laspeyre}}$
- 11) The event consisting of more than one sample points is called.
 (A) Compound event (B) Simple event (C) Null event (D) Independent event
- 12) The conditional probability of event A given that event B has already occurred is
 (A) $P(B/A)$ (B) $P(A/B)$ (C) $P(A \cup B)$ (D) $P(A \cap B)$
- 13) X and Y are two independent variables, then $E(XY)$ is.
 (A) $XE(Y)$ (B) $YE(X)$ (C) $E(X) + E(Y)$ (D) $E(X)E(Y)$
- 14) Let "a" and "b" are any two constants and "x" is a random variable, then $\text{var}(ax+b)$ is equal to
 (A) $a^2 \text{var}(X)$ (B) $a \text{var}(X)$ (C) $\text{var}(X)$ (D) a
- 15) The mean, median and mode of a binomial distribution will be equal, when
 (A) $p > q$ (B) $p < q$ (C) $p = q$ (D) $p < 0$
- 16) The number of parameters of Hypergeometric distribution are
 (A) 2 (B) 3 (C) 1 (D) 4
- 17) The mean of binomial distribution is
 (A) Equal to standard Deviation (B) Equal to variance (C) Greater than variance (D) Less than variance

Sargodha Board-2018

1118 Warning:- Please, do not write anything on this question paper except your Roll No.
Statistics (Subjective) (Session 2015-17 to 2017-19) Paper (I)
Time Allowed: 2.40 hours (Inter Part - I) Maximum Marks: 68

Section ----- I

2. Answer briefly any Eight parts from the followings:-

8 × 2 = 16

- (i) Write the names of two branches of statistics.
- (ii) Write two examples each for Continuous and Discrete variable.
- (iii) Define Geometric Mean. (iv) If mean = 75 and mode = 70 find median.
- (v) Define Arithmetic mean. (vi) State when it is impossible to calculate Harmonic Mean.
- (vii) The arithmetic mean of 20 values is 40.5 what is the total of values?
- (viii) Define Link Relatives. (ix) What do you mean by Consumer's Price Index Number?
- (x) Calculate Fisher's Index number if $\sum p_o q_o = 1850$, $\sum p_1 q_1 = 2100$, $\sum p_o q_1 = 2050$, $\sum p_1 q_o = 2000$
- (xi) Define composite price index number.
- (xii) What is the name of the base year weighted price index number?

3. Answer briefly any Eight parts from the followings:-

8 × 2 = 16

- (i) Define classification. (ii) Define frequency distribution. (iii) Define Standard Deviation.
- (iv) If $Q_1 = 20$, Quartile Deviation = 30, Find Q_3 .
- (v) If $\bar{X} = 36$, $S^2 = 36$, find coefficient of variation. (vi) Define the skewness.
- (vii) Given Mean = 50, Median = 48, SD = 6 Find coefficient of Skewness.
- (viii) What is a random experiment? (ix) Define independent events.
- (x) State the general rule of addition for probability.
- (xi) If $P(A) = 0.4$, $P(B) = 0.3$, Find $P(\bar{A})$, $P(\bar{B})$
- (xii) What is the range of probability?

4. Answer briefly any Six parts from the followings:-

6 × 2 = 12

- (i) Define Discrete Random Variable. (ii) Discuss two properties of Distribution function.
- (iii) Discuss two properties of probability density function.
- (iv) What is meant by expected value of a random variable?
- (v) If $E(X) = 1.15$ then find $E(3X + 5)$
- (vi) Write any two properties of binomial distribution
- (vii) In Binomial distribution Mean = 6, Var = 2.4 Find its parameters.
- (viii) If $x \sim h(x; 11, 5, 4)$. Find Mean and Variance of hypergeometric distribution.
- (ix) What are difference between Binomial and Hypergeometric distribution?

P.T.O

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Sargodha Board-2018

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Section ----- II



(8 x 3 = 24)

Note: Attempt any three questions.

5 (a) Calculate the median and mode from the following data.

X	2.5	7.5	12.5	17.5	22.5
f	7	18	25	30	20

(b) The arithmetic mean of two items is 12.5 and geometric mean is 10. Find two items.

6 (a) For the following frequency distribution find mean deviation

Ages	5 – 10	10 – 15	15 – 20	20 – 25
f	10	20	30	15

(b) Given the following results, find Combined Co-efficient of Variation.

$$n_1 = 100 \quad S_1 = 2.4 \quad \bar{X}_1 = 12.6$$

$$n_2 = 120 \quad S_2 = 4.2 \quad \bar{X}_2 = 15.8$$

7 (a) Compute chain indices using mean as an average from the following prices of commodities.

Years	A	B	C
2013	84	85	114
2014	80	99	122
2015	90	91	131
2016	78	92	142

(b) A bag contains 7 blue, 5 Black and 4 Red balls. If two balls are drawn at random, find the probability that (i) Both balls are blue (ii) One is black and other is Red.

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

x	-1	0	1	2	3
P (X=x)	0.125	0.500	0.200	0.050	0.125

Find $E(X)$, $E(X^2)$ and $P(X > 2)$

(b) A continuous random variable X has probability density function as $f(x) = \begin{cases} cx & \text{for } 0 < X < 2 \\ 0 & \text{elsewhere} \end{cases}$

Find (i) c (ii) $P(1 < X < 1.5)$

9(a) An event has probability $P = \frac{3}{5}$ Find complete binomial distribution for $n = 5$

(b) An urn contains nine balls, Five of them are red and four blue. Three balls are drawn without-replacement. Find the probability distribution of $X =$ the number of red balls drawn?