2019 (A) Roll No: _____

# INTERMEDIATE PART-I (11th CLASS)

## STATISTICS PAPER-I (NEW SCHEME)

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) 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.



P.T.O

## 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

| Paper Code Number: 2181 | 2019 (A) INTERMEDIATE PART-I (11th CLASS) | Roll No._____ |
|---|---|---|

**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) $\frac{\sum fx}{\sum f}$ (B) $A + \frac{\sum fD}{\sum f}$ (C) $A + \frac{\sum fU}{\sum f} \times h$ (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 = $Q_2 = D_4 = P_{30}$ (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

2019 (A) Roll No: _____

# INTERMEDIATE PART-I (11th CLASS)

## STATISTICS PAPER-I (OLD SCHEME)

TIME ALLOWED: 3.10 Hours **SUBJECTIVE** MAXIMUM MARKS: 83

**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 Descriptive Statistics.

(ii) What is Variable?

(iii) Define Average.

(iv) What are Quartiles?

(v) Identify Arithmetic Mean, Geometric Mean and Harmonic Mean from the following figures 29.5, 32.9 and 18.4.

(vi) For a certain frequency distribution, the mean was 40.5 and Median 36.
Find Mode by using the empirical relation.

(vii) Define Geometric Mean.

(viii) Define Index Number.

(ix) What is Composite Index Number?

(x) What is Base Period?

(xi) Define Unweighted Index Number.

(xii) Define Laspeyres Weighted Aggregative Price Index Number.

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

(i) What is Classification?

(ii) What is a Table?

(iii) What is meant by Absolute dispersion?

(iv) Write four measures of Relative Dispersion.

(v) If $S_x^2 = 5$, $y = 2x$ then what will be value of variance of $y$?

(vi) Define Mean Deviation.

(vii) Write down Bowley's formula of coefficient of Skewness.

(viii) If first moment about number 2 is equal to 5. Then find Mean.

(ix) Define Permutation.

(x) What is a Venn Diagram?

(xi) Define Simple event and Compound event.

(xii) What are Mutually Exclusive Events?

**4.** **Attempt any six parts.** **6 × 2 = 12**

(i) Define Continuous Random Variable.

(ii) $E(X^2) = 400$ and $Var(X) = 144$. Find $E(X)$.

(iii) Describe the properties of distribution function.

(iv) Given $x = 0, 1, 2$ and $p(x) = \frac{9}{16}, \frac{6}{16}, \frac{1}{16}$. Find $E(X)$.

(v) $Var(X) = 2$ and $Var(Y) = 5$, find $Var(3X - Y)$ if $X$ and $Y$ are independent.

(vi) What is binomial experiment?

(vii) Define Hypergeometric Distribution.

(viii) If $n = 8$, $p = \frac{1}{3}$ in binomial distribution, then find the mean and variance.

(ix) In a Hypergeometric Distribution, $N = 10$, $n = 2$ and $K = 3$, find $P(X = 0)$

## SECTION-II

**NOTE: - Attempt any three questions.**

5.(a) The mean and geometric mean of three numbers are 7 and 4 respectively. Find all the three numbers if the mean of the first two numbers is 10 4

(b) The deviation from $X = 22.5$ of 10 different values of '$X$' are $-12, -8.5, 3.0, 5.6, -4.5, 6.6, 9.2, 0.5, -1.7,$ and $2.6$. Find out $D_6$, $P_{37}$ of $X$. 4

6.(a) Compute standard deviation and coefficient of variation for the values

3, 5, 7, 13, 15, 17, 23, 27. 4

(b) Find coefficient of Skewness based on mean and mode. 4

| Classes | 10 – 19 | 20 – 29 | 30 – 39 | 40 – 49 | 50 – 59 |
|---|---|---|---|---|---|
| $f$ | 4 | 8 | 16 | 20 | 10 |

7.(a) Calculate weighted average of relative index taking 2016 as base year, of data given below: 4

| Commodity | A | B | C | D | E |
|---|---|---|---|---|---|
| Price in 2016 | 200 | 180 | 300 | 290 | 185 |
| Price in 2017 | 230 | 150 | 360 | 265 | 195 |
| Weights | 10 | 15 | 12 | 13 | 10 |

(b) Find $P(A \cup B)$ in each of following case: 4

(i) $P(A) = 0.8$ $P(B) = 0.18$ iff $A$ and $B$ are independent events

(ii) $P(A) = 0.6$ $P(B) = 0.35$ iff $A$ and $B$ are Mutually exclusive events

(iii) $P(A \cap B) = 0.7$ $P(A) = 0.8$ $P(B) = 0.6$ iff $A$ and $B$ are not Mutually exclusive events

8.(a) An unbiased coin is tossed 3 time. The probability distribution for number of heads is given below:

| $X$ | 0 | 1 | 2 | 3 | Total |
|---|---|---|---|---|---|
| $f(X)$ | $\frac{1}{8}$ | $\frac{3}{8}$ | $\frac{3}{8}$ | $\frac{1}{8}$ | 1 |

Find the distribution function $F(X)$.

(b) Two unbiased dice are cast. A payment in rupees equal to the sum of the spots on the top most sides is given to the caster. Compute the expected value and variance of the payment, if

$f(X) = \frac{6 - |7 - X|}{36}$ for $X = 2, 3, 4, \ldots, 12$ Find mean and variance of r.v.x. 4

9.(a) If $Y$ is binomially distributed with $n = 7$ and $p = 0.5$ then find (i) $P(Y = 6)$ (ii) $P(Y = 3)$ 4

(b) A committee of size 5 is to be selected at random from 6 women and 3 men. Find the probability of selecting at least three women in the committee. 4

## SECTION-III (PRACTICAL)

**10. Attempt any three parts.** **$3 \times 5 = 15$**

(A) Calculate combined mean of the following data:

$n_1 = 30$ $\bar{X}_1 = 62$

$n_2 = 37$ $\bar{X}_2 = 58$

$n_3 = 43$ $\bar{X}_3 = 61$

(B) Calculate 1st four moments about mean for the following data:
8, 10, 15, 22, 26, 30, 35, 40, 48

(C) Given the following informations:

$\sum p_1 q_0 = 41140$, $\sum p_0 q_0 = 35310$, $\sum p_1 q_1 = 46707$

$\sum p_0 q_1 = 40048$, $\sum p_2 q_0 = 39644$, $\sum p_2 q_2 = 51724$

$\sum p_0 q_2 = 47376$

Compute

i) Laspeyre's Price Index Number

ii) Paasche's Price Index Number

iii) Fisher's Ideal Price Index Number

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

(E) Find the mean and S.D. of give binomial distribution $(q + p)^3$

Paper Code Number: 6181

2019 (A) Roll No._____

# INTERMEDIATE PART-I (11th CLASS)

## STATISTICS PAPER-I (OLD 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) How many methods are used for the collection of data?

(A) 1 (B) 2 (C) 3 (D) 4

(2) The average of lower and upper class limits is called:

(A) Class boundary (B) Class frequency (C) Class mark (D) Class limit

(3) A graph of a cumulative frequency distribution is called:

(A) Histogram (B) Frequency polygon (C) Ogive (D) None of these

(4) The median of $-3, 0, -5$ is:

(A) $-3$ (B) 0 (C) $-5$ (D) Does not exist

(5) If $\Sigma(X-20)=25$, $\Sigma(X-18)=0$ then arithmetic mean will be:

(A) 25 (B) 18 (C) 38 (D) 20

(6) The variance of 5, 5, 5, 5, 5 is:

(A) 0 (B) 25 (C) 5 (D) 125

(7) The lack of symmetry is known as:

(A) Kurtosis (B) Moments (C) Skewness (D) None of these

(8) Which is least if $\bar{X}=200$?

(A) $\Sigma(X-100)^2$ (B) $\Sigma(X-200)^2$ (C) $\Sigma(X-50)^2$ (D) $\Sigma(X-150)^2$

(9) Link relative is equal to:

(A) $\frac{P_n}{P_o}\times 100$ (B) $\frac{P_o}{P_n}\times 100$ (C) $\frac{P_n}{P_{n-1}}\times 100$ (D) $\frac{P_n}{P_n}\times 100$

(10) If Laspeyere's index = 150 and Paache's index = 150 then Fisher's index is equal to:

(A) 100 (B) 150 (C) 200 (D) 300

(11) The probability of drawing a diamond card out of 52 cards is:

(A) $1/2$ (B) $1/52$ (C) $4/52$ (D) $1/4$

(12) Probability of sure event is:

(A) 1 (B) 0 (C) $-1$ (D) 0.6

(13) If '$c$' is a constant then $E(c)$ is:

(A) 0 (B) $c$ (C) 1 (D) x

(14) If $x$ and $y$ are independent random variables, then $E(XY)$ is equal to:

(A) $YE(X)$ (B) $XE(X)$ (C) $E(X)E(Y)$ (D) All these

(15) Which is true in binomial distribution?

(A) Mean > Variance (B) Mean < Variance (C) Mean = Variance (D) None of these

(16) Mean of binomial distribution is:

(A) $nq$ (B) $npq$ (C) $\sqrt{npq}$ (D) $np$

(17) If $N=40$, $n=5$, $K=4$ then mean of hypergeometric distribution is:

(A) 1 (B) $1/4$ (C) $1/2$ (D) $1/3$

## BOARD OF INTERMEDIATE AND SECONDARY EDUCATION,MULTAN
## OBJECTIVE KEY FOR INTERMEDIATE ANNUAL EXAMINATION,2019

Name of Subject: STATISTICS (New Scheme/Old) Session: _____

Group : 1st _____ Group: 2nd _____

| Q. Nos | Paper Code 2181 | Paper Code 2183 | Paper Code 2185 | Paper Code 2187 |
|---|---|---|---|---|
| 1 | A | C | A | D |
| 2 | C | A | C | A |
| 3 | B | B | A | C |
| 4 | D | D | B | A |
| 5 | A | A | D | C |
| 6 | C | A | A | A |
| 7 | A | C | A | B |
| 8 | C | B | C | D |
| 9 | A | B | B | A |
| 10 | B | A | B | A |
| 11 | D | A | A | C |
| 12 | A | C | A | B |
| 13 | A | B | C | B |
| 14 | C | D | B | A |
| 15 | B | A | D | A |
| 16 | B | C | A | C |
| 17 | A | A | C | B |
| 18 | | | | |
| 19 | | | | |
| 20 | | | | |

OLD SCHEME.

| Q. Nos | Paper Code 6181 | Paper Code | Paper Code | Paper Code |
|---|---|---|---|---|
| 1 | B | | | |
| 2 | C | | | |
| 3 | C | | | |
| 4 | A | | | |
| 5 | B | | | |
| 6 | A | | | |
| 7 | C | | | |
| 8 | B | | | |
| 9 | C | | | |
| 10 | B | | | |
| 11 | D | | | |
| 12 | A | | | |
| 13 | B | | | |
| 14 | C | | | |
| 15 | A | | | |
| 16 | D | | | |
| 17 | C | | | |
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Key