Roll No. Candidate: _____

STATISTICS **Intermediate Part-I , Class 11th (1stA 324- IV)** **PAPER: I**

Time: 20 Minutes **OBJECTIVE** **Marks: 17**

Code: 6187

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 more circles will result in zero mark in that question.

1- 1- The index numbers computed for a group of things are called _____ index numbers.
(A) simple (B) composite (C) weighted (D) price relative

2- For a set of positive values, which one has the least value?
(A) A.M. (B) G.M. (C) M.D. (D) H.M.

3- For a normal distribution, $\overline{X} \pm 2S$ include of the observations
(A) 68.27% (B) 88.27% (C) 95.45% (D) 99.73%

4- For a binomial distribution, the value of p is 0.7 , then distribution will be
(A) symmetrical (B) positively skewed (C) negatively skewed (D) not sure

5- The total area of the probability function is
(A) 0 (B) –1 (C) 1 (D) ∞

6- Two cards are drawn from a pack of 52 cards with replacement, then the probability of both aces is
(A) $\frac{1}{169}$ (B) $\frac{2}{13}$ (C) $\frac{3}{26}$ (D) $\frac{1}{221}$

7- Weight of any object is an example of
(A) constant (B) geographical data (C) continuous data (D) discrete data

8- The H.M. of 0 , 1 and 2 is
(A) 0 (B) 1 (C) 2 (D) cannot be found

9- In Histogram, _____ is taken along y-axis.
(A) class mark (B) frequency
(C) cumulative frequency (D) class boundaries

10- In hypergeometric distribution , the successive trials are
(A) dependent (B) independent (C) fixed (D) disjoint

11- If Var (X) = 1 , Var (Y) = 3 , then S.D. (X – Y) = ?
(A) 2 (B) 3 (C) 4 (D) – 2

12- Var (X – Y) = ?
(A) Var (X) – Var (Y) (B) $\sqrt{Var(X) - Var(Y)}$ (C) Var (X) + Var (Y) (D) $\sqrt{Var(X) + Var(Y)}$

13- In binomial distribution , n = 5 , p = 0.5 then P(x = – 2) = ?
(A) 1 (B) 0.5 (C) 0.8 (D) zero

14- Mid-point of the class 65 – 84 is
(A) 54.5 (B) 64.5 (C) 74.5 (D) 84.5

15- A portion of population selected for study is
(A) parameter (B) statistics (C) population (D) sample

16- The value of (–3)! Will be
(A) –6 (B) 6 (C) 0 (D) not defined

17- Which is link relative in chain indices?
(A) $\frac{P_n}{P_{n-1}} \times 100$ (B) $\frac{P_o}{P_n} \times 100$ (C) $\frac{P_n}{P_o} \times 100$ (D) $\frac{P_{n-1}}{P_n} \times 100$

S.. TISTICS | Intermediate Part-I , Class 11th (1st A 324) | PAPER: I

..ne: 2:40 Hours | SUBJECTIVE | Marks: 68

Note: Section-I is compulsory. Attempt any Three (3) questions from Section-II.

SECTION – I

2. Write short answers to any EIGHT (8) questions: **(2 x 8 = 16)**

i- Differentiate between parameter and statistics.

ii- What is meant by secondary data?

iii- How many significant digits are there in each of the following numbers?

(a) 400 (b) 0.00394

iv- Define Mode.

v- In a skewed distribution, Mode = 15 and Mean = 10.5 . Find Median.

vi- What is relationship among A.M. , G.M. and H.M. ?

vii- Find the arithmetic mean if $u = \frac{x-57}{5}$, $\sum u = 23$ and $n = 20$

viii- Write a formula for P_{37} (37^{th} percentile) for grouped data.

ix- Differentiate between Price Relative and Link Relative.

x- What are the steps in the construction of Index Numbers?

xi- If Laspeyre's Price Index is 116.51 and Paasche's Price Index is 118.39 then find Fisher Price Index.

xii- What is difference between Aggregative Expenditure Method and Family Budget Method?

3. Write short answers to any EIGHT (8) questions: **(2 x 8 = 16)**

i- What is frequency distribution?

ii- Differentiate between box – head and stub.

iii- Define Histogram.

iv- Given $\sum f = 120$, $\sum fx = 296$, Mode = 2.944 , find Median.

v- Given $Q_3 = 178.25$, Q.D = 53.725 , find Q_1

vi- Define standard deviation and give its formulas.

vii- $\bar{X} = 200$, C.V = 7 , find Standard Deviation (S.D)

viii- Given $X_m = 15$, $X_o = 3$, find Range and its co-efficients.

ix- Differentiate between simple event and compound event.

x- Define combination.

xi- Given that $P(A) = 1/3$, $P(B) = 1/2$, $P(\bar{A} \cap B) = 1/2$, find $P(A \cap B)$

xii- Given that $P(A) = 1/4$, $P(B/A) = 1/2$, $P(A/B) = 1/4$, then find $P(\bar{A}/\bar{B})$

4. Write short answers to any SIX (6) questions: **(2 x 6 = 12)**

i- Define probability density function.

ii- Write down the properties of probability density function.

iii- If $E(x) = 0.63$, $var(x) = 0.2331$ then find $E(x^2)$.

iv- Given $x = 0 , 1 , 2$ and $p(x) = 4c , 3c , c$ then find the value of c.

v- Define binomial probability distribution.

vi- Given $n = 6$, $p = \frac{1}{2}$, then compute its mean and S.D.

vii- Write down the formula of hypergeometric distribution.

viii- Discuss the statement that in binomial distribution, mean = 5 and S.D = 3

ix- Write any two properties of hypergeometric distribution.

(Turn over)

SECTION – II

5- **(a)** A variable Y is determined from a variable X by the equation $Y = 14 - 5X$. Find Y when $X = -3, -2, -1, 0, 1, 2, 3, 4, 5$ and show that $\overline{Y} = 14 - 5\overline{X}$ **4**

(b) Calculate the Geometric mean for the following data : **4**

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

6- **(a)** Find the co-efficient of Q.D from the following data : **4**

Groups	5 – 9	10 – 14	15 – 19	20 – 24	25 – 29
f	3	4	12	6	5

(b) Estimate the co-efficient of skewness from the given information. **4**

$n = 100$, $\sum x = 6000$, $\sum x^2 = 360900$, Median $= 60$

7- **(a)** Construct the cost of living I. No. of 1990 on the basis of 1986 using the family budget method. **4**

Expense on	Food	Rent	Clothing	Fuel	Misc.
	35%	15%	20%	10%	20%
Price 1986	150	30	75	25	40
Price 1990	145	30	65	23	45

(b) A bag contains 5 white and 4 black balls. Two balls are drawn together. Find the probability that **4**

i) both are white ii) both are black

8- **(a)** From the following probability distribution, find mean and variance **4**

x	0	1	2	3	4
P(x)	$\frac{1}{16}$	$\frac{4}{16}$	$\frac{6}{16}$	$\frac{4}{16}$	$\frac{1}{16}$

(b) A continuous random variable "x" has density function as **4**

$$f(x) = \begin{cases} 2x & \text{for} \quad 0 \le x \le 1 \\ 0 & \text{elsewhere} \end{cases}$$

Find i) $P\left(x < \frac{1}{4}\right)$ ii) $P(0.25 < x < 0.50)$

9- **(a)** A and B play a game in which A's chances of winning are 2/3. A series of 5 games is played. Find the probability that **4**

i) A will win 3 games

ii) A will win at least 3 games.

(b) Given that "x" is a hypergeometric random variable with N = 8 , n = 3 and K = 5 , then find **4**

i) $P(x \le 1)$

ii) $P(x > 1)$

Roll No._____

STATISTICS **Intermediate Part-I , Class 11th (1stA 323- III)** **PAPER: I**

Time: 20 Minutes **OBJECTIVE** **Marks: 17**

Code: 6185

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 more circles will result in zero mark in that question.

1- 1- The standard deviation of binomial distribution is

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

2- If $\sum(X-\overline{X})^2 = 180$ and $n = 9$, then m_2 is

(A) 25 (B) 9 (C) 20 (D) 18

3- The index given by $\frac{\sum p_n q_n}{\sum p_o q_n}$ is

(A) Laspeyre's index (B) Paasche's index (C) Value index (D) Fisher index

4- Let 'a' is a constant and 'X' is a random variable, then S.D.(aX) is

(A) a^2 S.D.(X) (B) S.D.(X) (C) aS.D.(X) (D) zero

5- If $B_2 = 3$, then the distribution is called

(A) mesokurtic (B) platykurtic (C) leptokurtic (D) ogive

6- Total angles of a pie chart are

(A) 360° (B) 180° (C) 190° (D) 90°

7- The probability of an impossible event is equal to

(A) zero (B) 1 (C) –1 (D) 2

8- The most frequent value in the data is

(A) Mean (B) Median (C) Mode (D) G.M.

9- Quantities which do not vary

(A) variables (B) constants (C) statistics (D) all of these

10- The Mean of Hypergeometric distribution is

(A) $\frac{NK}{n}$ (B) $\frac{N}{nK}$ (C) $\frac{n}{NK}$ (D) $\frac{nK}{N}$

11- First moment about mean is always equal to

(A) 1 (B) –1 (C) 2 (D) zero

12- The number of parameters of binomial distribution, are

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

13- If two dice are rolled, the possible outcomes are

(A) 6 (B) 12 (C) 216 (D) 36

14- A single value which represents a distribution is called

(A) S.D. (B) Variance (C) Average (D) C.V.

15- Geometric mean of 2 and 8 is

(A) 8 (B) 4 (C) 5 (D) 2

16- In fixed base method the base period should be

(A) far away (B) abnormal (C) normal (D) unreliable

17- If $f(x) = \frac{1}{10}$ and x=10, then E(X) is

(A) zero (B) 1 (C) $\frac{1}{2}$ (D) –1

STATISTICS | Intermediate Part-I , Class 11th (1st A 323) | PAPER: I

Time: 2:40 Hours | SUBJECTIVE | Marks: 68

Note: Section-I is compulsory. Attempt any Three (3) questions from Section-II.

SECTION – I

2. Write short answers to any EIGHT (8) questions: **(2 x 8 = 16)**

i- Define statistics.
ii- Differentiate between variable and constant.
iii- Write down any four qualities of a good average.
iv- Define Geometric Mean.
v- Given $\sum(X-10)=2.8$ and $n=5$. Find Mean : $\overline{X}$
vi- Define weighted arithmetic mean.
vii- Given $L=60$, $h=10$, $f=20$, $n=80$ and $c=30$. Find median.
viii- Write down the empirical relationship between mean, median and mode.
ix- Define Price Relative.
x- Given P_{on}(Laspeyre's) $=120$, P_{on}(Paasche's) $=118$. Find P_{on}(Fisher) price index number.
xi- Given $W=20$, 25, 30 , 40 and $I=100$, 105 , 110 , 120. Find consumer price index number.
xii- What are the uses of index numbers?

3. Write short answers to any EIGHT (8) questions: **(2 x 8 = 16)**

i- Define tabulation.
ii- Define frequency distribution.
iii- What is meant by absolute dispersion?
iv- First, second and third quartiles of a distribution are 142, 153 and 167 respectively. Find coefficient of skewness.
v- Write down two properties of variance.
vi- What do you mean by kurtosis?
vii- Given that $n=8$, $\sum D=10$, $\sum D^2=524$. Find variance, where $D=X-15$
viii- Define mean deviation.
ix- Define probability of an event.
x- What are independent events?
xi- State addition law of probability for mutually exclusive events.
xii- State multiplication law of probability for two independent events.

4. Write short answers to any SIX (6) questions: **(2 x 6 = 12)**

i- What do you mean by probability density function?
ii- Narrate two laws of expectation.
iii- Given that $E(X+4)=10$ and $E(X+4)^2=116$. Find variance $(X+4)$
iv- A continuous random variable X has probability density function

$F(X)=c(4-X)$ for $1\le X\le 3$

$=0$ elsewhere

Find the value of c.

v- For a binomial distribution with $n=10$ and $p=\frac{1}{3}$. Find $P(X=5)$
vi- If X is a hypergeometric random variable with $N=8$, $n=6$ and $K=5$. Find S.D.(X)
vii- Describe hypergeometric experiment.
viii- Write down the properties of a binomial experiment.
ix- Describe hypergeometric probability distribution.

(Turn over)

SECTION – II

Note: Attempt any Three (3) questions.

5- **(a)** Find the G.M. of the following data 4

Classes	10 – 19	20 – 29	30 – 39	40 – 49	50 – 59
f	5	25	40	20	10

(b) The reciprocals of 8 values of X are given below: 4
0.0500 , 0.0454 , 0.0400 , 0.0333 , 0.0285 , 0.0232 , 0.0213 , 0.0200
Calculate A.M. and H.M.

6- **(a)** Find the coefficient of variation for the following data 4

Marks	1 – 3	3 – 5	5 – 7	7 – 9
f	10	15	20	25

(b) Find mean deviation from the following data 4

Group	2 – 4	4 – 6	6 – 8	8 – 10	10 – 12
f	3	45	6	4	3

7- **(a)** Compute Fisher Ideal index number using 2010 as base year, for the following data 4

Commodities	Prices		Quantities	
	2010	2015	2010	2015
A	10	12	120	100
B	8	10	150	130
C	12	13	80	70
D	15	20	60	50

(b) A card is selected from a deck of playing cards. Find the probability that 4
i) The card is black
ii) The card is queen card
iii) The card is spade card
iv) The card is a face card

8- **(a)** A random variable 'X' has the following distribution 4

X	0	1	2	3
P(X)	0.1	0.2	0.3	0.4

Find (i) E(X) (ii) Var(X)

(b) Given the following probability distribution 4

X_i	0	1	2	3	4
$P(X_i)$	1/126	20/126	60/126	40/126	5/126

Verify that E(2X+3) = 2E(X)+3

9- **(a)** Out of 800 families with 5 children each, how many would you expect to have 4
i) At least 3 boys
ii) At most 1 boy

(b) Four balls are drawn from a bag containing 4 white and 7 black balls. If "X" denotes the number of black balls are drawn, then obtain the probability distribution of X. Also find the Mean of the distribution. 4

Roll No._____

Statistics

Time: 20 Minutes

(INTER PART-I Class 11th) 322-(IV)

Code: 6187

OBJECTIVE

PAPER: I

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 more circles will result in zero mark in that question. Attempt as many questions as given in objective type question paper and leave others blank.

1- 1- Random numbers are generated by _____ methods.

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

2- ${}^3P_2$ is equal to

(A) 3 (B) 5 (C) 6 (D) 1

3- The distribution is symmetrical, then b_1 is

(A) negative (B) positive (C) zero (D) 3

4- The graph of frequency distribution is called

(A) histogram (B) historigram (C) ogive (D) f. curve

5- Hypergeometric distribution has parameters

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

6- If E(X) = 1.6 then E(5x + 10) = _____

(A) 18 (B) 15 (C) 10 (D) 05

7- The best year for base year is

(A) first year (B) last year (C) sound economic year (D) 3rd year

8- The types of dispersion are

(A) 2 (B) 3 (C) 4 (D) 5

9- The mean of binomial distribution is

(A) nPq (B) nP (C) $\sqrt{nPq}$ (D) $\sqrt{nP}$

10- The standard deviation from mean is always

(A) negative (B) positive (C) zero (D) fractional

11- Statistics is a word of _____ language.

(A) Latin (B) English (C) French (D) German

12- The mean of 10 numbers is 9, then sum of these numbers is

(A) 10 (B) 70 (C) 90 (D) 80

13- The most suitable average for index number is

(A) A.M. (B) G.M. (C) H.M. (D) median

14- The sum of values divided by their numbers is called

(A) mode (B) median (C) mean (D) G.M.

15- When the coin is tossed the sample space is

(A) [H, H] (B) [T, T] (C) [H , T] (D) none of these

16- The most popular value of the data set is called

(A) A.M. (B) median (C) mode (D) G.M.

17- Mid-point of the group 5.5 --- 7.5 is

(A) 6 (B) 6.5 (C) 7 (D) 7.5

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Statistics (INTER PART-I Class 11th) 322 **PAPER: I**

Time: 2:40 Hours **SUBJECTIVE** **Marks: 68**

Note: Section I is compulsory. Attempt any Three (3) questions from Section II.

SECTION I

2. Write short answers to any EIGHT (8) questions: **(2 x 8 = 16)**

i- Differentiate between parameter and statistic.

ii- Distinguish between primary data and secondary data.

iii- Given $\ell = 60$, $h = 10$, $f = 20$, $n = 80$ and $c = 30$. Find median.

iv- If $A = 98$, $h = 5$, $\Sigma fu = -30$ and $\Sigma f \neq 30$. Find $\overline{X}$

v- Define the term average.

vi- What do you understand by combined arithmetic mean?

vii- What are the merits of mode?

viii- Describe harmonic mean and write down the formula to calculate it.

ix- Given $\Sigma P_0 = 1397$, $\Sigma P_1 = 1804$ and $\Sigma P_2 = 2265$. Calculate simple aggregative price index number.

x- Given $W = 19, 23, 8, 17, 20$ and $I = 100, 136, 129, 144, 155$. Find consumer price index number.

xi- Define price relative and write down its formula

xii- Describe Laspeyre's price index number.

3. Write short answers to any EIGHT (8) questions: **(2 x 8 = 16)**

i- What is meant by cummulative frequency?

ii- Define tabulation.

iii- What do you understand by dispersion?

iv- If $n = 15$, $\Sigma X = 480$, $\Sigma X^2 = 15735$. Find the C.V.

v- Define moments.

vi- Write the formula's of Karl's Pearson's coefficient of skewness.

vii- Given that $Q_1 = 89$, Q.D = 10.875, then find the value of Q_3.

viii- Define range & its coefficient.

ix- Define a Null OR empty set.

x- If $P(A) = 0.2$, $P(B) = 0.4$ $P(A/B) = 0.375$, then $P(A \cap B) = ?$

xi- Find Bowley's coefficient of skewness if $Q_1 = 95$, $Q_3 = 84$ and median = 81

xii- Solve: ${}^{52}C_2$

4. Write short answers to any SIX (6) questions: **(2 x 6 = 12)**

i- Define random variable. Also give an example.

ii- Define continuous random variable. Also give an example.

iii- Define discrete probability distribution.

iv- If var(x) = 2. Find var(3x + 2)

v- Is it possible to have a binomial distribution with mean = 5 and S.D. = 4 ?

vi- If $E(X) = 2$ and $E(X^2) = 10$. Calculate coefficient of variation.

vii- Define binomial experiment.

viii- Define hypergeometric distribution.

ix- Write down the formulae of computing mean and variance of hypergeometric distribution.

(Turn over)

SECTION II

5- (a) A man gets rise of 10 % in salary at the end of 1st year of job, a further rise of 20 % and 25 % at the end of 2nd and 3rd years respectively. To what average annual percent increase is this? 4

(b) The reciprocals of 11 values of X are given below. Find arithmetic mean: 4

0.0500, 0.0454, 0.0400, 0.0333, 0.0285, 0.0232,

0.0213, 0.0200, 0.0182, 0.0151, 0.0143

6- (a) Compute the coefficient of variation: 4

No. of Children	0	1	2	3	4	5
No. of Families	8	10	15	20	13	4

(b) Calculate first four moments about mean from the following data: 4

45. 32, 37, 46, 39, 36, 41, 48, 36

7- (a) Construct index number for 1963 assuming 1953 as base period by 4
(i) Laspeyre's formula (ii) Paasche's formula

Commodity	1953		1963	
	Price	Quantity	Price	Quantity
A	2	50	10	40
B	3	10	8	5
C	4	6	4	5

(b) From a well-shuffled pack of 52 cards, a card is drawn at random. What is the probability that it is 4

(i) a card of diamond (ii) an ace

(iii) a pictured card (iv) a black card

8- (a) Given $P(x) = K\binom{4}{x}$ and $x = 0, 1, 2, 3, 4$ Find the value of K. 4

(b) Given that $E(X^2) = 400$ and S.D.(X) = 12 Find E(X) and C.V. 4

9- (a) Out of 800 families with 5 children each; how many would you expect to have at least 3 boys? 4

(b) A committee of size 5 is to be selected at random from 3 women and 5 men. Find complete probability distribution for number of women in the committee. 4

Gujranwala Board-2019

Roll No. of Candidate: _____

Statistics (New Scheme)
Time: 20 Minutes

(INTERMEDIATE PART-I) 319-(IV)
OBJECTIVE
Code: 6187

Paper: I
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. Attempt as many questions as given in objective type question paper and leave other blank.

1. If mean of 10 numbers is 8 then sum of numbers is:
   A) 10 B) 70 C) 80 D) 90

2. If 'x' and 'y' are random variables, $E[x - y]$ is
   A) $E(x) + E(y)$ B) $E(x) - E(y)$ C) $x - E(y)$ D) $E(x) - y$

3. No. of parameters in hypergeometric distribution is:
   A) 2 B) 3 C) 4 D) 5

4. A distribution having one mode is called:
   A) unimodal B) bimodal C) multimodal D) none of these

5. Variance of Binomial Distribution is:
   A) nq B) npq C) np D) pq

6. If $P(A \cap B) = P(A)\,P(B)$, events A and B are:
   A) not-mutually exclusive B) mutually exclusive
   C) independent D) dependant

7. Which is not measure of dispersion:
   A) mean B) range C) mean deviation D) standard deviation

8. Fisher Index number is the _____ of Laspeyre's and Paasche's index numbers
   A) arithmetic mean B) median C) geometric mean D) mode

9. If 'c' is non-random variable, then E(c) is:
   A) c B) zero C) one D) $\sum x\,p(x)$

10. Data which have been arranged in ascending or descending order is:
    A) quantitative variable B) grouped data C) arrayed data D) un-grouped data

11. The data about the sex of new born babies is called:
    A) quantitative B) qualitative C) continuous D) discrete

12. The sum of absolute deviations of observations from median is:
    A) maximum B) minimum C) zero D) one

13. Base year quantities as weight are used in:
    A) Laspeyre's method B) Paasche's method C) Fisher D) none of these

14. A set of all possible outcomes of a random experiment is called:
    A) null set B) sample space C) simple event D) all of these

15. The Co-efficient of variation is:
    A) absolute dispersion B) relative dispersion C) skewness D) average

16. If there are ten values each value equal to 10, then standard deviation is:
    A) zero B) 10 C) 100 D) 1000

17. The difference between upper and lower class boundary of each group is:
    A) mid-point B) average C) class interval D) frequency

Statistics (New Scheme) **(INTERMEDIATE PART-I) 319** **Paper: I**
Time: 2:40 Hours **SUBJECTIVE** **Marks: 68**
Note: Section I is compulsory. Attempt any THREE (3) questions from Section II.

(SECTION – I)

2. Write short answers to any EIGHT questions. **(2 × 8 = 16)**

i. Define "Primary Data".
ii. Define "Variable".
iii. Define "Median" with formula.
iv. Write two properties of A.M (Arithmetic Mean).
v. Write two demerits of H.M (Harmonic Mean).
vi. Define "Mode".
vii. Write two properties of G.M (Geometric Mean).
viii. Define "Weighted Index Number".
ix. If $\sum p_o q_o = 362$, $\sum p_1 q_o = 428$, $\sum p_o q_1 = 398$, $\sum p_1 q_1 = 470$ then compute Fisher's index number.
x. Define "Price Index Number".
xi. Write two advantages of Chain base method.
xii. Find Paasche's Price Index Number given that: $\sum p_1 q_1 = 1210$, $\sum p_o q_1 = 850$

3. Write short answers to any EIGHT questions. **(2 × 8 = 16)**

i. What is simple classification?
ii. Define "Grouped Data".
iii. Define "Range".
iv. What are different measures of absolute dispersion?
v. If Var(x) = 4 , Find Var(3x)
vi. What is "Variance"?
vii. If $\mu_2 = 4$, $\mu_4 = 56$, Find β_2
viii. What is "Kurtosis"?
ix. Define "Random Experiment".
x. Define "Equally Likely Events".
xi. If P(A) = 0.5 , P(B) = 0.2 , Find P(A ∪ B) when 'A' and 'B' are mutually exclusive events.
xii. A card is selected from 52 playing cards. What is probability that the card is a king?

4. Write short answers to any SIX questions. **(2 × 6 = 12)**

i. Define "Mathematical Expectation" of a random variable.
ii. Explain continuous random variable with an example.
iii. What are the properties of a discrete probability distribution?
iv. Given: $E(x) = 0$ and $E(x^2) = \frac{8}{9}$. Find $E(3x^2 - 2x + 5)$.
v. Given: $E(x) = 0.56$, $Var(x) = 1.36$ and if $y = 2x + 1$ then find $E(y)$ and $Var(y)$.
vi. Define "Binomial experiment".
vii. If 'x' is a binomial random variable with $n = 9$, $p = \frac{1}{3}$ then find S.D(3 + 2x).
viii. State probability function of Hypergeometric distribution. Also write its mean and variance.
ix. Given: $N = 10$, $n = 2$ and $k = 2$. Find $P(x = 0)$.

(Turn Over)

STATISTICS (New Scheme) **(INTER PART - I) 318 - (I)** **Paper - I**

Time: 20 Minutes **OBJECTIVE** **Marks: 17**

Code: 6181

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. Attempt as many questions as given in objective type question paper and leave others blank.

1. 1 - A variable that can take only isolated points on a number line is

(A) discrete variable (B) continuous variable (C) qualitative variable (D) attribute

2 - A relative frequency is expressed in the form of

(A) whole number (B) percentage (C) fractional (D) constant

3 - The total angle in pie-diagram is

(A) 360° (B) 180° (C) 270° (D) 100°

4 - The mean and median of any two values are always

(A) mean = median (B) mean > median (C) mean < median (D) less than zero

5 - Harmonic mean cannot be computed if any of the observations is

(A) one (B) negative (C) zero (D) fractional

6 - If " X " and " Y " are independent variables then var (x – y) is equal to

(A) var (X) – var (Y) (B) var (X) + var (Y) (C) var (X) (D) var (Y)

7 - Second moment about mean is also

(A) variance (B) standard deviation (C) mean (D) median

8 - The range of the values -2, -3, -5, -10 is

(A) -12 (B) -8 (C) 8 (D) 9

9 - The index number of base period is always

(A) zero (B) 100 (C) greater than 100 (D) less than 100

10 - Paasche's price index number is also known as

(A) current year weighted (B) base year weighted (C) CPI (D) simple price index

11 - The probability of an event is always

(A) greater than zero (B) greater than one (C) between zero and one (D) less than zero

12 - The joint probability of two independent events A and B is

(A) P(A)+P(B) (B) P(A)+P(B)-P(A∩B) (C) P(A)P(A/B) (D) P(A)P(B)

13 - Let " x " is a random variable, then var(x) is

(A) $E(x^2)-(E(x))^2$ (B) $E(x)-E(x^2)$ (C) $E(x^2)-E(x)$ (D) $(E(x))^2-E(x^2)$

14 - Let " a " is a constant and " x " is a random variable, then SD(ax) is

(A) $a^2SD(x)$ (B) a SD(x) (C) SD(x) (D) zero

15 - The standard deviation of binomial probability distribution is

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

16 - The number of parameters of binomial distribution are

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

17 - The mean of hypergeometric distribution is

(A) $\frac{NK}{n}$ (B) $\frac{nK}{N}$ (C) $\frac{N}{nK}$ (D) $\frac{n}{NK}$

STATISTICS (New Scheme) (INTER PART - I) 318 Paper - I

Time: 2:40 Hours SUBJECTIVE Gujranwala Board-2018 Marks: 68

Note: Section I is compulsory. Attempt any three (3) questions from Section II.

(SECTION – I)

2. Write short answers to any EIGHT questions. (2 x 8 = 16)

i - Define statistics as a field of study.

ii - Write any two sources of secondary data.

iii - Define an average.

iv - What do you mean by weighted mean?

v - If $n_1 = 30, n_2 = 20$ and $\bar{x}_1 = 10, \bar{x}_2 = 15$, then find combined mean $\bar{x}_c$.

vi - Write the names of positional averages.

vii - If $\Sigma(x-35) = 0, \Sigma(x-40) = 5$ and $\Sigma(x-45) = -5$ what is the value of mean and why?

viii - What is base period?

ix - Find Paasche's price index number if $\Sigma p_1 q_1 = 1050$ and $\Sigma p_0 q_1 = 1000$.

x - Define composite index number.

xi - Which averages are used in construction of an index number?

xii - Find consumer's price index number by family budget method if $\Sigma WI = 131950$ and $\Sigma p_0 q_0 = 750$.

3. Write short answers to any EIGHT questions. (2 x 8 = 16)

i - Define tabulation.

ii - For the class intervals 4-7, 8-11, 12-15 make class boundaries.

iii - Define mean deviation.

iv - Find range of -1, -3, 0, 2, 5, 8.

v - If Q_1=12, Q_3=36, find quartile deviation.

vi - Define co-efficient of variation.

vii - Define kurtosis.

viii - Define simple and compound events.

ix - What is the classical definition of probability?

x - If A and B are independent events, P(A)=0.4, P(B) = 0.3 Find P(A∩B).

xi - Define equally likely events.

xii - If P(A) = 0.3 , P(B) = 0.8, P(A∩B) = 0.2 Find P(A∪B).

4. Write short answers to any SIX questions. (2 x 6 = 12)

i - Define continuous random variable.

ii - Define discrete probability distribution.

iii - What are random numbers, how the random numbers can be generated?

iv - Explain the "Mathematical Expectation".

v - If E(x) = 1.15 and $E(x^2) = 2.15$ then find var(x).

vi - Define binomial probability distribution.

vii - If $x \sim b(20, \frac{3}{5})$. Find mean and variance of binomial distribution.

viii - Write down four properties of hypergeometric experiment.

ix - If N = 6, n = 4, K = 3. Write down function of hypergeometric distribution. Also find P (x = 1).

(Trun Over)

(SECTION – II)

5. (a) The daily wages for a group of 200 persons have been obtained from a frequency distribution of a continuous variable x, after making the substitution $u = \frac{x-130}{20}$. (4)

U	-2	-1	0	1	2
Number of persons	7	50	50	40	3

Find G.M.

(b) 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? (4)

6. (a) Calculate standard deviation. (4)

Wages	30 – 35	35 – 40	40 – 45	45 – 50	50 – 55
f	12	18	29	32	16

(b) Computer calculated mean and standard deviation from 20 observations as 42 and 5 respectively. It was later discovered at the time of checking that it had copied down two values as 45 and 38 where as the correct values were 35 and 58 respectively. Find correct value of co-efficient of variation. (4)

7. (a) Construct chain indices from the following price relatives using median as an average: (4)

Years	A	B	C
2010	82	78	120
2011	63	55	129
2012	105	88	112
2013	94	76	155
2014	61	44	166

(b) If two persons " A " and " B " can solve 70% and 80% of problems of a certain book respectively, then find the probability that a problem chosen at random will be solved by at least one of them. (4)

8. (a) From the following probability distribution find mean and variance: (4)

X	0	1	2	3	4
P(X = x)	$\frac{1}{16}$	$\frac{4}{16}$	$\frac{6}{16}$	$\frac{4}{16}$	$\frac{1}{16}$

(b) A continuous random variable X has a density function as (4)

$$f(x) = \begin{cases} 2x & 0 \le x \le 1 \\ 0 & \text{elsewhere} \end{cases}$$

Find i) $P\left(X < \frac{1}{2}\right)$ ii) $P\left(\frac{1}{4} < X < \frac{1}{2}\right)$

9. (a) A certain event is believed to follow the binomial distribution. In 1024 samples of 5, $p = \frac{1}{3}$. (4)

Find complete binomial frequency distribution.

(b) There are seven people who work in an office. Of them, four would like to be transferred. If three people from this office are randomly selected for transfer, what is the probability that (4)

i) All three will want to be transferred.

ii) At most one will want to be transferred.