| ☆☆ | Roll No _____ |
|---|---|

Inter - (Part-I) - A / 2024
(For All Sessions)

| Paper Code | 6 | 1 | 8 | 4 |
|---|---|---|---|---|

## Statistics (Objective)

Marks : 17   Time: 20 Minutes

Note:- Write answers to the questions on the objective answer sheet provided. Four possible answers are given. Which answer you consider correct fill the corresponding circle A,B,C or D in front of each question with marker or ink on the answer sheet provided.

1.1 The sum of the probability in discrete probability distribution is :
- (A) One
- (B) Two
- (C) Zero
- (D) −1

2. A binomial probability distribution has variance :
- (A) npq
- (B) nq
- (C) $\sqrt{npq}$
- (D) $n^2 p^2 q^2$

3. Hypergeometric probability distribution has parameters :
- (A) 1
- (B) 2
- (C) 3
- (D) 4

4. In Binomial probability distribution trials are :
- (A) Independent
- (B) Dependent
- (C) Sometimes Independent
- (D) Always dependent

5. A quantity computed from sample is called :
- (A) Parameter
- (B) Statistic
- (C) population
- (D) Sample

6. Statistical laws are true:
- (A) Always
- (B) Not in the long run
- (C) On the average
- (D) None of these

7. Total of relative frequency is :
- (A) Two
- (B) Half
- (C) Three
- (D) One

8. A pie diagram is represented by a :
- (A) Square
- (B) Triangle
- (C) Rectangle
- (D) Circle

9. The sum of deviations from Arithmetic Mean is :
- (A) 1
- (B) 2
- (C) 3
- (D) 0

10. Geometric Mean of 2,4,8 is :
- (A) 4
- (B) Zero
- (C) 6
- (D) 16

11. The variance of 5,5,5 and 5 is :
- (A) 5
- (B) Zero
- (C) 25
- (D) 125

12. For a symmetrical distribution
- (A) $b_1 > 0$
- (B) $b_1 < 0$
- (C) $b_1 = 0$
- (D) $b_1 = 3$

13. Link relatives can be obtained by dividing $P_n$ by :
- (A) $P_0$
- (B) $q_n$
- (C) $q_{n-1}$
- (D) $p_{n-1}$

14. Index Number for base period is always :
- (A) 100
- (B) 150
- (C) 50
- (D) 200

15. The probability of red card out of 52 cards is :
- (A) $\frac{1}{4}$
- (B) $\frac{4}{52}$
- (C) $\frac{1}{2}$
- (D) Zero

16. If $A \cap B = \emptyset$ then A and B are :
- (A) Not Mutually Exclusive
- (B) Equally likely
- (C) Exhaustive
- (D) Mutually Exclusive

17. The expected value of a random variable is equal to its :
- (A) Variance
- (B) S.D.
- (C) Mean
- (D) Covariance

847-11- A-

HSSC - (Part-I) – A / 2024
(For All Sessions)

Roll No _____

# Statistics (Subjective)

Time: 2:40 Hours     Marks : 68

## Section - I

2. **Give short answers of any eight parts from the following .** (2x8=16)

   (i) Explain giving examples, the term data.

   (ii) Narrate any two sources of collecting primary data.

   (iii) Describe any two characteristics of Statistics.

   (iv) Explain combined mean with formula.

   (v) Describe the empirical relation between mean, median and mode for moderately skewed distribution.

   (vi) Given that $u = \frac{X-150}{5}$, $\sum fu = 100$ and $\sum f = 200$. Find $\overline{X}$.

   (vii) Find the Modal letter of the word "DISTRIBUTION"

   (viii) Describe the weighted aggregative price index number.

   (ix) Define the term price relative with formula.

   (x) If link relatives are 100,107,114 and103. Find chain indices.

   (xi) Given that $X_1 = 4$ and $X_2 = 16$. Show that G.M. $= \sqrt{A.M. \times H.M.}$

   (xii) Given that $\sum p_1 q_1 = 1400$, $\sum p_2 q_2 = 1600$, $\sum p_0 q_1 = 1360$ and $\sum p_0 q_2 = 1560$. Compute Paasche's price index number.

3. **Give short answers of any eight parts from the following .** (2x8=16)

   (i) Define primary data.

   (ii) Enlist the methods of collecting Secondary data.

   (iii) What is frequency distribution?

   (iv) Define Q.D.(Quartile Deviation).

   (v) $n = 15$, $\sum X = 480$, $\sum X^2 = 15735$. Find the Coefficient of Variation.

   (vi) $\overline{X} = 200$, C.V. $= 7\%$ .Find the value of variance.

   (vii) Mean = 29.6, Mode = 24.8, S= 15, Find Coefficient of skewness.

   (viii) What is venn-diagram?

   (ix) Define moments.

   (x) Suppose $P(A) = \frac{1}{3}$, $P(B) = \frac{1}{2}$ and $P(\bar{A} \cap B) = \frac{1}{2}$. Find $P(\bar{A} \cap \bar{B})$

   (xi) Define the terms sample space and events.

   (xii) If A and B are two independent events such that $P(A) = 0.2$, $P(B) = 0.15$, then evaluate $P(A /B)$.

4. **Give short answers of any six parts from the following.** (2x6=12)

   (i) Describe two properties of mathematical expectation.

   (ii) Write down the properties of probability density function.

   (iii) If Var(X) = 3, compute Var(3X).

   (iv) Given that E(X) = 200 and C.V. = 7%. Find Var(X).

   (v) Write down formulae for mean and standard deviation of binomial distribution.

   (vi) In a binomial distribution n = 5, $q = \frac{1}{2}$. Find P(X=3).

   (vii) Is it possible that in a binomial distribution mean is 6 and variance is 6.25. Give reason.

   (viii) In a hypergeometric distribution n = 5, k = 4 and N = 11. Compute its mean.

   (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 from the following. (8x3=24)

5. (a) The following data is the frequency distribution of number of leaves on the branches of a tree: (4)

| No. of leaves | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|
| No. of branches | 3 | 8 | 11 | 18 | 20 | 13 |

   Find the mean and the mode of number of leaves per branch.

   (b) The reciprocals of 8 values of X are given below : (4)

   0.0400, 0.0345, 0.0540, 0.0333, 0.0175, 0.0632, 0.0113, 0.0210. Calculate the Arithmetic Mean and Harmonic Mean.

6. (a) Calculate mean deviation from median from the following data : (4)

| Classes | 15-19 | 20-24 | 25-29 | 30-34 |
|---|---|---|---|---|
| $f$ | 2 | 4 | 6 | 3 |

   (b) What can you say about skewness in each of the following cases : (4)

   (i) Median = 26, $Q_3 = 38$, $Q_1 = 14$

   (ii) Mean = 1403, Mode = 1487, Standard Deviation = 12

7. (a) From the data given below, construct Consumer price Index Number of 1986 on the basis of 1976 by using Aggregate expenditure method: (4)

| Food | Prices | | Quantity |
|---|---|---|---|
| | 1976 | 1986 | 1976 |
| Wheat | 8 | 14 | 4 |
| Rice | 15 | 21 | 2 |
| Daal | 10 | 14 | 1 |
| Oil | 20 | 30 | 5 |
| Ghee | 6 | 12 | 3 |

   (b) A pair of fair dice is thrown. If the two numbers appearing are different, find the probability that : (4)

   (i) The sum is 6.

   (ii) The sum is four or less.

8. (a) From an urn containing 4 red and 6 white round marbles, a man draws three marbles at random without replacement. If X is a random variable which denotes the number of red marbles drawn, then what is the probability distribution of X. (4)

   (b) A continuous random variable X has probability density function given by : $f(x) = \frac{2}{27}(x + 1)$ ; for $2 \leq x \leq 5$ . Find: (4)

   (i) $P(X < 4)$

   (ii) $P(3 \leq X \leq 4)$

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HSSC - (Part-I) - A / 2023

Roll No _____ to be filled in by the candidate

(For All Sessions)

Paper Code | 6 | 1 | 8 | 6

**Statistics (Objective)**

Time: 20 Minutes   Marks : 17

Note:-    Write answers to the questions on the objective answer sheet provided. Four possible answers are given. Which answer you consider correct fill the corresponding circle A,B,C or D in front of each question with marker or ink on the answer sheet provided.

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1.1    The range of probability is between :

(A)    0 to 1        (B)    -1 to +1        (C)    0 to ∞        (D)    -∞ to 0

2.    Random numbers can be generated :

(A)    Manually        (B)    Mechanically        (C)    Both (A) & (B)        (D)    None of these

3.    If C is constant, then E (C) = _____.

(A)    C        (B)    zero        (C)    1        (D)    None of these

4.    In a binomial experiment , the successive trials are :

(A)    Fixed        (B)    Dependent        (C)    Independent        (D)    All of these

5.    The mean and variance of Binomial distribution are :

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

6.    The mean of hyper geometric distribution is:

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

7.    At present word statistics is used in _____ senses.

(A)  2        (B)  3        (C)  4        (D)  None of these

8.    A statistical table has at least _____ parts.

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

9.    Median divides the data into _____ parts.

(A)  2        (B)  4        (C)  10        (D)  100

10.    The most frequent value of data if it exists is :

(A)    Mode        (B)    Median        (C)    Mean        (D)    Geometric Mean

11.    The mean is based on :

(A)    Small values        (B)    Large values        (C)    All values        (D)    None of these

12.    For a symmetrical distribution,

(A)    $\beta_1 = 0$        (B)    $\beta_1 = 3$        (C)    $\beta_1 = -1$        (D)    $\beta_1 = -3$

13.    Mean deviation of the values 4,4,4,4, is :

(A)    zero        (B)    4        (C)    8        (D)    12

14.    The standard deviation of 8,8,8,8,8 is

(A)    $\sqrt{8}$        (B)    8        (C)    Zero        (D)    $(8)^2$

15.    Which is the most suitable average in chain base method?

(A)    AM        (B)    GM        (C)    HM        (D)    Median

16.    CPI is the abbreviation of _____ Price Index.

(A)    Consumer        (B)    Constant        (C)    Current        (D)    Special

17.    A coin and a die can be thrown together in _____ ways.

(A)    2        (B)    12        (C)    8        (D)    24

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Roll No _____ to be filled in by the candidate

Time: 2:40 Hours    Marks : 68

## Statistics (Subjective)

Section - I

2x8=16

2. Give short answers of any eight parts from the following .
   (i) What is Inferential Statistics.
   (ii) Define data with an example.
   (iii) What are demerits of the Harmonic Mean?
   (iv) Find A.M. when D = X-20, n = 30 and $\sum D$ = 60.
   (v) What is fixed base method to find index numbers?
   (vi) What are consumer price index numbers?
   (vii) What is the mode in the data 3,7,8,8,4,3,2 and 3?
   (viii) Write two merits of Mode.
   (ix) What are the simple index numbers?
   (x) Given that Laspeyre's index = 140 and Paasche's index = 142. Find Fisher's index.
   (xi) Find the value of mode in symmetrical distribution when the value of Mean and Median is 10 each.
   (xii) Find G.M. when A.M. and H.M. of two values are 64 and 4 respectively.

3. Give short answers of any eight parts from the following .

   2x8=16

   (i) Explain pie Chart in your own words.
   (ii) What do you mean by skewed distribution?
   (iii) Describe the measure of dispersion.
   (iv) Define quartile deviation with formula.
   (v) Narrate any two properties of standard deviation.
   (vi) What do you mean by mesokurtic distribution?
   (vii) Explain empirical definition of probability.
   (viii) Distinguish between the terms sample point and outcome.
   (ix) If two fair coins are tossed, find the probability of getting no heads.
   (x) Suppose $P(A) = \frac{1}{3}$, $P(A \cup B) = \frac{1}{2}$ and $P(A \cap B) = \frac{1}{10}$. Find P(B).
   (xi) Given that n = 10, $\sum(X-15)$ = -20 and $\sum (X - 15)^2$ = 524. Find variance.
   (xii) Given that mean = 50, median = 48 and coefficient of skewness = 1. Find the value of variance.

4. Give short answers of any six parts from the following.

   2x6=12

   (i) What do you mean by expected value of a random variable?
   (ii) Define random variable.
   (iii) Describe the properties of the probability distribution.
   (iv) What is a Bernoulli trial?
   (v) What is the mean and variance of hypergeometric distribution?
   (vi) Describe two properties of binomial experiment.
   (vii) If $p = \frac{1}{3}$, n = 15, what will be the mean and variance of binomial distribution?
   (viii) Given $f(X) = \frac{x}{10}$, x = 1,2,3,4. Show that f(X) is a probability function.
   (ix) If X is hypergeometric r.v. with N = 10 , n =4 and k = 3, find P (X = 1).

Section - II

Note:- Attempt any three question from the following.

8x3=24

5. (a) Find arithmetic mean from the following data:

   4 + 4 =8

   | Classes | 0-10 | 10-40 | 40-90 | 90-140 |
   |---------|------|-------|-------|--------|
   | f | 40 | 110 | 150 | 70 |

   (b) The reciprocal of X values are given below :
   0.0500, 0.0454, 0.0400, 0.0333, 0.0285. Find Geometric Mean of X.

6. (a) First three moments of distribution about X = 2 are 1, 2.5, and 5.5. Calculate Mean and Coefficient of Variation

   4 + 4 =8

   (b) Compute the coefficient of skewness from the given data :

   | Groups | 0-10 | 10-20 | 20-30 | 30-40 |
   |--------|------|-------|-------|-------|
   | f | 4 | 12 | 7 | 2 |

7. (a) Compute link relatives and chain indices :

   4 + 4 =8

   | Years | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
   |-------|------|------|------|------|------|------|
   | Prices | 146 | 151 | 158 | 171 | 179 | 190 |

   (b) A pair of dice are rolled. Find the probability that the sum of the uppermost dots is either 6 or 9.

8. (a) A fair coin is tossed three times. Let X be a random variable which denotes the number of heads. What is the probability distribution of X?

   4 + 4 =8

   (b) A continuous random variable X has probability density function :
   f(x) = C. x    for 0 < x < 2
   Calculate (i)    C    (ii)    P(1 < x < 1.5)

9. (a) A bag contains 4 red and 6 black balls. A sample of 4 balls is selected from a bag without replacement. Let x be the number of red balls. Find the probability distribution of X.

   4 + 4 =8

   (b) In a binomial distribution with n = 5, what is the value of other Parameters if P (X = 0) = P (X = 1). Find its Mean and variance.

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# Rawalpindi Board-2022

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*Inter - (Part-I)-A-2022*

Roll No._____ *to be filled in by the candidate*

(For All Sessions)

| Paper Code | 6 | 1 | 8 | 8 |

# Statistics .(Objective Type)

**Time:20 Minutes**

**Marks:17**

NOTE: Write answers to the questions on objective answer sheet provided. Four possible answers A, B, C & D to each question are given. Which answer you consider correct, fill the corresponding circle A, B, C or D given in front of each question with marker or pen ink on the answer sheet provided.

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1.1. The probability of sure event is.

(A) 0    (B) 1    (C) >1    (D) <1

2. The amount of milk produced by cow is _____ variable.

(A) Discrete    (B) Continuous    (C) Qualitative    (D) None

3. If $E(X)=4$, the arithmetic Mean will be.

(A) 4    (B) Zero    (C) 8    (D) 1

4. In binomial experiments, each trial has:

(A) One outcome    (B) Two outcomes    (C) Three outcomes    (D) Four outcomes

5. In hypergeometric distribution $N = 6, n = 2, K = 3$, then mean is:

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

6. The grouped data are also called.

(A) Raw data    (B) Primary data    (C) Secondary data    (D) Qualitative data

7. The average value of a lower and upper limits of a class is called:

(A) Class boundary    (B) Class frequency    (C) Mid point    (D) Class interval

8. Graph of time series is known as:

(A) Histogram    (B) Ogive    (C) Historigram    (D) Polygon

9. Geometric Mean of the values 2, 4, -3, 6, 0 is:

(A) -3    (B) 0    (C) 3    (D) Cannot be computed

10. We must arrange the data before calculating:

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

11. If 10% is added to each value of variable, the geometric mean of new variable is added by:

(A) 10%    (B) No change    (C) 10    (D) 110

12. Variance remains unchanged by change of:

(A) Scale    (B) Origin    (C) Both (A) and (B)    (D) None

13. A measure of dispersion is always:

(A) Zero    (B) Positive    (C) Negative    (D) None of these

14. Second moment about Mean is called:

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

15. In chain base method, the base period is:

(A) Fixed    (B) Changed    (C) Constant    (D) None of these

16. Base year weighted index numbers are:

(A) Laspeyre's Index    (B) Paasche's Index    (C) Fisher Index    (D) Marshall Index

17. The probability of an event always lies between:

(A) Zero and 2    (B) -1 and +1    (C) Zero and 1    (D) -2 and +2

Roll No._____ *to be filled in by the candidate*     (For All Sessions)

# Statistics (Essay Type)

Time: 2:40 Hours                Section - I                Marks:68

2- Write short answers of any eight parts from the following.                2 x 8 = 16

i. Define statistics.

ii. Distinguish between discrete variable and continuous variable.

iii. Find the G.M from the following values. 4, 5, 10, 0, 20.

iv. Define Median.

v. Write down the advantages of mode.

vi. What are merits of mode?

vii. If sum of deviation from X = 15 for 10 values is 25, then find A.M.

viii. Define weighted mean.

ix. Define composite index number.

x. If paasche's I.No = 74.76 and Fishers I.No = 75.76 then find Laspayer's I.No = ?

xi. 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* find Fisher's Ideal I.No.

xii. Define link relative.

3- Write short answers of any eight parts from the following.                2 x 8 = 16

i. Define "Histogram".

ii. Define relative frequency.

iii. Define Quartile deviation.

iv. Compute coefficient of quartile deviation, if $Q_1 = 12.50$ and $Q_3 = 48.36$

v. Define range. Also give an example.

vi. Define mean deviation.

vii. Compute coefficient of standard deviation if Mean = 125 and standard deviation = 2.

viii. Compute mean coefficient of dispersion if mean deviation = 3.92 and Mean = 16.25

ix. Make a sample space if we toss a fair coin three times.

x. How many permutations can be formed from the word "STATISTICS"?

xi. Give the statement of addition Law of probability for two non-mutually exclusive events.

xii. State the multiplication law of probability for independent events.

4- Write short answers of any six parts from the following.                2 x 6 = 12

i. What are random numbers?

ii. Explain the properties of the random experiment.

iii. What is probability density function?

iv. Differentiate between discrete and continuous random variables.

v. If E(X) = 3 and E(Y) = 2.5, then find E(X+Y).

vi. What is a binomial distribution?

vii. What are parameters of binomial distribution?

viii. State the formula of hypergeometric distribution.

ix. In hypergeometric distribution n = 5, K = 4 and N = 12 then find its mean.

## Section - II                8 x 3 = 24

NOTE : Answer any three questions from the following.

5.(a) The frequency distribution given below has D = X − 8 Find the Geometric Mean.

| D | −12 | −8 | −4 | 0 | 4 | 8 | 12 | 16 |
|---|---|---|---|---|---|---|---|---|
| f | 2 | 5 | 8 | 18 | 22 | 13 | 8 | 4 |

(b) Compute the median and mode of the following distribution.                04+04

| Classes | 0-7 | 7-14 | 14-21 | 21-28 | 28-35 |
|---|---|---|---|---|---|
| f | 5 | 8 | 7 | 15 | 5 |

6.(a) Compute mean deviation from the data given below using mean.

| Classes | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 |
|---|---|---|---|---|---|
| f | 5 | 8 | 12 | 10 | 5 |

(b) Calculate Bowley's coefficient of skewness for the following data.                04+04

| Groups | 2-4 | 4-6 | 6-8 | 8-10 | 10-12 |
|---|---|---|---|---|---|
| frequency | 3 | 5 | 7 | 3 | 2 |

7.(a) Compute Fisher's index number for the following data.                04+04

| commodities | Base year Price | Base year Quantity | Current year Price | Current year Quantity |
|---|---|---|---|---|
| A | 7 | 70 | 5 | 49 |
| B | 5 | 27 | 7 | 28 |
| C | 10 | 35 | 9 | 29 |
| D | 9 | 50 | 4 | 42 |

(b) A pair of dice is thrown. Find the probability of getting a total of either 5 or 11.

8.(a) Find the missing value of 'A' from the following probability distribution.

| x | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| P(x) | 0.01 | 0.25 | 0.40 | A | 0.04 |

Also find $E(x)$

(b) A continuous random variable X has a density function. $f(x) = 2x,\ 0 \le x \le 1$ find $P(0 < x < 0.2)$                04+04

9.(a) A fair coin is tossed 5 times. What is the probability of getting.
i) Exactly 3 heads     ii) At least 3 heads

(b) Find $P(x \le 2)$ for hypergeometric distribution having N = 8, K = 5, n = 6                04+04

# Statistics (Objective Type)

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

NOTE: Write answers to the questions on objective answer sheet provided. Four possible answers A,B,C & D to each question are given. Which answer you consider correct, fill the corresponding circle A,B,C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1. Expected value of a random variable is equal to
   (A) Standard Deviation   (B) Mean Deviation   (C) Variance   (D) Mean

2. For a random variable X if var(X)=4 then var(2X+4) will be
   (A) 12   (B) 16   (C) 20   (D) 32

3. For a binomial distribution with parameters n and P, mean and variance are related as
   (A) Mean=Variance   (B) Mean>Variance   (C) Mean<Variance   (D) Always coincide

4. In hypergeometric distribution with n=5, K=10 and N=20 the mean is:
   (A) 2.5   (B) 10   (C) 40   (D) 3/4

5. A characteristic that does not vary from individual to individual is called
   (A) Variable   (B) Constant   (C) Continuous variable   (D) Discrete random variable

6. A chart in which adjacent rectangles are used:
   (A) Simple Bar Chart   (B) Pie Chart   (C) Histogram   (D) Component Bar Chart

7. If in a certain data range=1000 and number of classes are 20 then class interval will be
   (A) 40   (B) 50   (C) 60   (D) 100

8. If $\bar{x}$ = 10, and y=6+2x then $\bar{y}$ will be
   (A) 20   (B) 24   (C) 26   (D) 30

9. Which of the following is based on all values of a data set?
   (A) $Q_1$   (B) Median   (C) Mode   (D) Geometric Mean

10. The geometric mean of 0,2,4 and 6 is:
    (A) 2   (B) 0   (C) 4   (D) 6

11. Which of the following is a measure of dispersion?
    (A) First quartile   (B) 2nd quartile   (C) Coefficient of Skewness   (D) Range

12. The standard deviation is:
    (A) The square of variance   (B) Half of the variance
    (C) Square root of the variance   (D) Two times of the variance

13. The first moment about mean is equal to
    (A) 1   (B) 0   (C) Variance   (D) Standard Deviation

14. $\dfrac{\sum p_n q_o}{\sum p_o q_o} \times 100$ is called
    (A) Paasche's index   (B) Laspeyre's index   (C) Fisher's index   (D) Value index

15. Fisher's index number is _____ of Laspeyre's and Paasche's index numbers:
    (A) Arithmetic mean   (B) Geometric mean   (C) Harmonic mean   (D) Median

16. The probability of obtaining an even number when a fair die is rolled
    (A) $\dfrac{1}{4}$   (B) $\dfrac{1}{3}$   (C) $\dfrac{1}{2}$   (D) 1

17. If A and B are two non-mutually exclusive events then P(A∪B) be.
    (A) P(A)+P(B)   (B) P(A)P(B)   (C) P(A)+P(B)-P(A∩B)   (D) P(A/B)P(B)

Roll No._____ *to be filled in by the candidate.*  (For all sessions)

# Statistics (Essay type)

Time: 2:40 Hours  SECTION-I  pakcity.org  Marks: 68

**2- Write short answers of any eight parts from the following.**  2 x 8 =16

i. Define statistics and data

ii. What is population and sample?

iii. Write two merits of arithmetic mean.

iv. Define Median and give its formula

v. Write two merits of median.

vi. What is Fisher's Index number?

vii. What are Deciles?

viii. What is composite index number?

ix. Define Value Index.

x. What is consumer price index number?

xi. Define Mean. What is formula for calculation of mean for group data?

xii. What are the types of weighted aggregative index number?

**3- Write short answers of any eight parts from the following.**  2 x 8 =16

i. What do you mean by TABULATION?

ii. If second moment about mean is 5, what is fourth moment for a mesokurtic distribution?

iii. Define the term DISPERSION

iv. Define Mutually Exclusive Events.

v. Define HISTOGRAM.

vi. If $Var(x)=16$, then find the variance of $5x-100$.

vii. Define moments.

viii. Define Mean Deviation.

ix. Define Conditional Probability.

x. What is the probability of a Red card in a pack of 52 cards?

xi. $C_r^n =$ _____.  $P_r^n =$ _____.

xii. State Multiplicative Law of probability for dependent events.

**4- Write short answers of any six parts from the following.**  2 x 6 =12

i. Define Random Variable.

ii. Describe two properties of discrete probability distribution.

iii. What is mean and variance of bionomial distribution with parameters n and p?

iv. Write down any two properties of Expectation.

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

vi. Define bionomial experiment.

vii. Define probability density function (p.d.f).

viii. Define Hypergeometric probability distribution.

ix. In hypergeometric distribution $N=7, n=5$ and $K=2$ Find $P(x=0)$

## SECTION-II

**Note: Attempt any three questions from the following.**  8x3=24

**5. (a)** For the following frequency distribution if $D=x-18$, Find GM  4

| D | -12 | -8 | -4 | 0 | 4 |
|---|---|---|---|---|---|
| f | 2 | 5 | 8 | 18 | 22 |

**(b)** A bus traveling 200 miles has 10 stages at equal intervals. The speed of bus at various stages was observed to be 10,15,20,75,20,30,40,50,30 and 40 miles per hour. Find average speed at which the bus has traveled.  4

**6. (a)** Calculate co-efficient of variation from the following frequency distribution.  4

| X | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| f | 17 | 9 | 6 | 5 | 3 |

**(b)** First four moments of a distribution about x=2 are 1,2.5,5.5 and 16. Calculate mean and Co-efficient of variation.  4

**7. (a)** The following data gives prices and quantities of four commodities for the years 2000 and 2002. Find Paasche's index.  4

| Commodity | Prices | | Quantities | |
|---|---|---|---|---|
| | 2000 | 2002 | 2000 | 2002 |
| A | 70 | 75 | 300 | 310 |
| B | 72 | 80 | 240 | 275 |
| C | 25 | 32 | 132 | 148 |
| D | 60 | 85 | 280 | 360 |

**(b)** If the probability of a horse A winning a race is 1/5 and that of a horse B is 1/6. What is the probability that one of them wins?  4

**8. (a)** The probability distribution of a random variable x is given as.  4

| x | 0 | 1 | 2 | 3 |
|---|---|---|---|---|
| P(x) | 0.1 | 0.2 | 0.3 | 0.4 |

Show that $E(5x+8)=5E(x)+8$

**(b)** For a continuous random variable X, Probability density function is:  4

$f(x)=cx$  $0 \leq x \leq 2$.  Find (i) value of c  (ii) $P(\frac{1}{2} \leq x \leq \frac{3}{2})$

**9. (a)** A fair coin is tossed four times. Find the probability that there will appear  4

(i) Atleast 2 heads.  (ii) Atmost 2 heads.

**(b)** In hypergeometric distribution determine the following  4

(i) n=4, N=10, K=3. Find P(x=2)  (ii) n=7, N=12, K=8. Find P(x=6)