Statistics (New Scheme)    (INTER PART - I CLASS 11ᵗʰ) (I)    Time :20 Minutes

Paper : 1    ( Academic Session 2017 – 2019 )    Marks : 17

## OBJECTIVE

### 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 with marker or pen. Cutting or filling two or more circles will result in zero mark in that question.

1.  i.  A quantity computed from sample is called:

   (A) parameter    (B) statistic    (C) constant    (D) population

  ii.  The process of arranging observations in different classes is called:

   (A) classification    (B) tabulation    (C) sampling    (D) frequency distribution

  iii.  The cumulative frequency distribution is graphically represented by:

   (A) frequency curve    (B) frequency polygone    (C) pie-diagram    (D) ogive

  iv.  For a certain frequency distribution $\Sigma(x-20) = 25$ and $\Sigma(x-18) = 0$ then mean is

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

  v.  Harmonic mean of any two numbers "a" and "b" is :

   (A) $\dfrac{a+b}{2}$    (B) $\sqrt{ab}$    (C) $\dfrac{2ab}{a+b}$    (D) $\dfrac{a+b}{2ab}$

  vi.  Which of the following is a measure of dispersion?

   (A) Mean    (B) Mean Deviation    (C) Median    (D) Quartile

  vii.  The variance of 5 , 5 , 5 , 5 is :

   (A) 5    (B) 25    (C) zero    (D) one

  viii.  For a symmetrical distribution the moment ratio:

   (A) $\sqrt{b_1} = 0$    (B) $\sqrt{b_1} = 3$    (C) $\sqrt{b_1} > 3$    (D) $\sqrt{b_1} < 0$

  ix.  Which price relative is used in chain indices?

   (A) $\dfrac{p_n}{p_0} \times 100$    (B) $\dfrac{p_n}{p_{n-1}} \times 100$    (C) $\dfrac{p_{n-1}}{p_n} \times 100$    (D) $\dfrac{p_0}{p_{n-1}} \times 100$

  x.  The Index number constructed for the prices of more than one commodity is called:

   (A) simple price index    (B) volume price index    (C) composite price index    (D) mixed

  xi.  Which of the following cannot be the probability of an event?

   (A) 1.75    (B) zero    (C) 0.36    (D) 0.82

  xii.  Two events A and B are said to be mutually exclusive if :

   (A) $P(A \cap B) = 1$    (B) $P(A \cap B) = 0$    (C) $P(A \cup B) = 0$    (D) $P(A \cup B) = 1$

  xiii.  Let $p(x)$ is a probability mass function of discrete random variable X , then $\Sigma p(x)$ is:

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

  xiv.  "a" and "b" are any two constants and "X" is a variable, then $E(ax+b)$ is :

   (A) $aE(x) + b$    (B) $aE(x)$    (C) $E(x)$    (D) $a^2 E(x) + b$

  xv.  The binomial probability distribution is positively skewed when:

   (A) $p = \dfrac{1}{2}$    (B) $p = q$    (C) $p > \dfrac{1}{2}$    (D) $p < \dfrac{1}{2}$

  xvi.  The variance of binomial probability distribution $(q+p)^3$ is :

   (A) $\sqrt{3pq}$    (B) $3pq$    (C) $pq$    (D) $3p$

  xvii.  Hypergeometric probability distribution has parameters:

   (A) n , N , k    (B) n , k    (C) N , k    (D) N , n

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Roll No:_____ Annual 2018

**Statistics (New Scheme):**　　　　(INTER PART - I CLASS 11th )　　　Time : 2 : 40 Hours

**Paper : I**　　　　　　　　　　**SUBJECTIVE**　　　　　　　　　Marks : 68

**Academic Session 2017 – 2019**

Note :-　Section I is compulsory.　Attempt any three Questions from section II.

**( Section – I )**

2.　**Write short answers to any Eight parts.**　　　　　　　　**( 8 x 2 = 16)**

　i.　What are the two types of quantitative variables?

　ii.　What is descriptive Statistics?

　iii.　Define Median and write the formula to find it from continuous grouped data.

　iv.　The sum of deviations of 10 values from $X = 40$ is 250, what is the value of arithmetic mean?

　v.　Define Harmonic mean.

　vi.　Give two important properties of Arithmetic Mean.

　vii.　Compute Geometric mean of 5 , 25 , 125.

　viii.　Define weighted index number.

　ix.　What is composite price index number?

　x.　If Fischer's and Paasche's index numbers are 108 and 109 respectively, what is Laspeyre's index number?

　xi　Define the chain indices.

　xii.　Explain fixed base method.

3.　**Write short answers to any Eight parts.**　　　　　　　　**( 8 x 2 = 16 )**

　i.　What is size of class interval?

　ii.　Define classification.

　iii.　What are measures of dispersion?

　iv.　Define range.

　v.　If $n = 10$ , $\Sigma x = 50$ , $\Sigma x^2 = 360$, find variance.

　vi　If $\Sigma x = 180$ , $s^2 = 36$ , $n = 5$　find C.V .

　vii.　Define moments.

　viii.　Define sample space.

　ix　If A and B are mutually exclusive events, $P(A) = 0.4$ , $P(B) = 0.3$ , Find $P(A \cup B)$.

　x　Define equally likely events.

　xi.　Define independent events.

　xii.　Write sample space when a coin is tossed two times.

4.　**Write short answers to any Six parts.**　　　　　　　　**( 6x 2 = 12 )**

　i.　Define continuous random variable.

　ii.　What are properties of discrete probability distribution?

　iii.　Given $f(x) = \dfrac{k}{x}$ , $x = 1, 2, 3$, find $k$

　iv.　If $E(X) = 1.1$ , find $E(3x+5)$.

　v.　Define random numbers.

**( Turn Over )**

vi.  Define the binomial experiment.

vii.  If $n = 10$, $p = \frac{1}{2}$, find variance of binomial distribution.

viii.  Write the formula of hypergeometric probability distribution.

ix.  If $N = 11$, $n = 5$, $k = 7$, find variance of hypergeometric distribution.

### Section = II

Note:- Attempt any three (3) questions:          ( 3 X 8 = 24 )

5.  (a)  Find the value of mode by using the empirical relationship between averages for the following data.

| Marks | 2-4 | 4-6 | 6-8 | 8-10 | 10-12 |
|---|---|---|---|---|---|
| No. of Students | 5 | 25 | 40 | 20 | 10 |

(b)  Calculate harmonic mean of the variable X from the following data.

| $U = \frac{X - 3.5}{0.5}$ | -3 | -2 | -1 | 0 | 1 | 2 | 3 |
|---|---|---|---|---|---|---|---|
| Frequency | 15 | 38 | 65 | 92 | 80 | 40 | 20 |

6.  (a)  For the following frequency distribution, find quartile deviation.

| Marks | 10 - 20 | 20 - 30 | 30 - 40 | 40 - 50 | 50 - 60 |
|---|---|---|---|---|---|
| frequency | 3 | 8 | 14 | 7 | 4 |

(b)  Given that $\Sigma f = 76$, $\Sigma fy = 572$, $\Sigma fy^2 = 4848$, $\Sigma fy^3 = 44240$ and $\Sigma fy^4 = 42580$.

Find first three moments about mean and $b_1$.

7.  (a)  Construct index numbers from the following data by applying

(i) Laspeyer's method  (ii) Paasche's method

| Commodities | Base year | | Current year | |
|---|---|---|---|---|
| | price | quantity | price | quantity |
| A | 8 | 55 | 2 | 50 |
| B | 4 | 105 | 4 | 115 |
| C | 6 | 65 | 8 | 55 |
| D | 12 | 35 | 14 | 19 |

(b)  An integer is selected at random from first 200 positive integers. What is the probability that integer chosen is divisible by "6" or " 8".

8.  (a)  A random variable X has following probability distribution.

| $x$ | -2 | -1 | 0 | 1 | 2 | 3 |
|---|---|---|---|---|---|---|
| $P(X = x)$ | 0.1 | k | 0.2 | 0.3 | 0.2 | 0.15 |

Find (i)  k  (ii)  $P(X \geq 2)$  (iii)  $P(X = -2)$  (iv)  $P(X > 3)$

(b)  A continuous random variable X has the probability density function as

$$f(x) = \begin{cases} a(x+3) & for\, 2 \leq x \leq 8 \\ 0 & elsewhere \end{cases}, \quad find\ (i)\quad a \quad (ii)\quad p(3 < x < 5)$$

9.  (a)  Team A has probability $\frac{2}{3}$ of winning whenever it plays. If A plays 4 games, find the probability that A wins  (i)  Exactly 2 games  (ii)  At least one game

(b)  A box contains ten items, seven of which are good and three are defective. Two items are selected (Without replacement). Compute the probability distribution for the number of defectives in the sample of two.

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