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) $a^{2}SD(x)$ (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) $\dfrac{NK}{n}$ (B) $\dfrac{nK}{N}$ (C) $\dfrac{N}{nK}$ (D) $\dfrac{n}{NK}$

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 $P(A \cap B)$.

   xi - Define equally likely events.

   xii - If P(A) = 0.3 , P(B) = 0.8, $P(A \cap B) = 0.2$ Find $P(A \cup B)$.

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).

(SECTION – II)

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

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 **(4)** 6 men if the average wage of all 10 men is Rs.20?

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 **(4)** 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.

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 **(4)** respectively, then find the probability that a problem chosen at random will be solved by at least one of them.

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

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

(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) $P\left(X < \dfrac{1}{2}\right)$ ii) $P\left(\dfrac{1}{4} < X < \dfrac{1}{2}\right)$

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

Find complete binomial frequency distribution.

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

  i)   All three will want to be transferred.

  ii) At most one will want to be transferred.