

Write Serial No. of your answer book _____

Time Allowed : 20 Minutes

Maximum Marks : 17

Signature of Deputy Supdt. _____

Note : Use this paper to write the answers to the objective questions. No mark will be awarded for cutting, over-writing or using a pencil. This paper must be tagged with the answer-book.

1. Some possible answers to each statement are given below. Tick (✓) mark the correct answer : 17

- (i) The grouped data is : (Primary, Secondary, Raw data, None of these.)
- (ii) The mid-point of the group 5.5-7.5 is : (6, 6.5, 7, 13)
- (iii) The sum of deviations from arithmetic mean is : (0, 5, a, 1)
- (iv) The sum of the squares of deviation is least from :
(Mean, Mode, Median, Harmonic Mean.)
- (v) $\sum (X - 20) = 25$, $\sum (X - 18) = 0$ then arithmetic mean will be :
(25, 18, 38, 20)
- (vi) If Mean = 40, Mode = 42, then distribution is :
(+ skew, - skew, Symmetrical, All of these.)
- (vii) The types of dispersion are : (2, 3, 4, 5)
- (viii) For a symmetrical distribution : ($\beta_1 = 0$, $\beta_1 = 3$, $\beta_2 = 3$, $\beta_2 = 3$)
- (ix) Second moment about mean is : (0, 1, Variance, Standard deviation)
- (x) Which index number has a wide scope : (Special, General, Price, Quantity.)
- (xi) In chain base method, the base period is : (Fixed, Changed, Constant, None of these.)
- (xii) The probability of drawing any one spade card is :
($\frac{1}{52}$, $\frac{1}{13}$, $\frac{4}{13}$, $\frac{1}{4}$)
- (xiii) In the tossing of two perfect coins the probability at least one head occur is :
($\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$, 1)
- (xiv) If $E(X) = 4$, then find arithmetic mean will be : (4, 8, 0, 1)
- (xv) If 'C' is a non-random variable, then $E(C)$ is : (c, 0, 1, x)
- (xvi) The parameters of the binomial distribution are :
(p and q, q and n, n and p, n, p, q)
- (xvii) In hypergeometric distribution, the trials are :
(Independent, Dependent, Independent and dependent, None of these.)

Note : All questions are/attempted on the answer book.

SECTION – I

2. Write any TWENTY TWO short answers of the following questions :

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- (i) Describe two functions of Statistics.
- (ii) What is primary data?
- (iii) What is tabulation?
- (iv) Define histogram.
- (v) What is an Ogive?
- (vi) Define arithmetic mean.
- (vii) What is the mode of the letters in the word "STATISTICS"?
- (viii) Define mode.
- (ix) What are important types of average?
- (x) What do you mean by percentiles?
- (xi) Find the arithmetic mean given $D = X - 18$, $\sum fD = 150$ and $n = 25$
- (xii) Define range.
- (xiii) What will be the variance of 3, 3, 3, 3, 3, 3?
- (xiv) Define moments.
- (xv) What are important types of dispersion?
- (xvi) For a set of ungrouped values the following sums are found :
 $n = 5$, $\sum X = 480$, $\sum X^2 = 15735$ Find coefficient of variation.
- (xvii) What would be the shape and name of the frequency distribution if :
(i) mean = median = mode (ii) mean > median > mode
- (xviii) Define an index number.
- (xix) Name the three basic types of index number.
- (xx) Given the following information :
 $\sum (W \times I) = 8074.5$, $\sum W = 60.25$. Find consumer price index number.
- (xxi) What is Laspeyre's index number?
- (xxii) How many possible permutations can be formed from the word "PAKPAITAN"?
- (xxiii) Show that ${}^3C_0 = {}^5C_5$
- (xxiv) Write the statement for multiplication law of probability for independent events.
- (xxv) What is the range of probability?
- (xxvi) What is the probability of selecting a white ball from 4 red, 8 black and 3 white balls?
- (xxvii) Define equally likely events?
- (xxviii) What does "P.d.f." stand for?
- (xxix) Given $E(X) = 3.5$ and $E(X^2) = 15.17$ find var (X).
- (xxx) Is it possible to have a binomial distribution with mean 5 and S.D. = 3?

(2)

2. (xxxi) What is range of the binomial random variable X ?
(xxxii) What is mean and variance of the binomial probability distribution?
(xxxiii) Define hypergeometric distribution.

SECTION - II

Note : Attempt any THREE questions.

3. (a) Following are the number of mistakes made by 30 typists in a test :
5, 6, 0, 5, 8, 4, 3, 5, 7, 9, 4, 7, 8, 6, 8,
3, 2, 7, 1, 4, 5, 9, 6, 4, 5, 10, 5, 4, 9, 6
Make a frequency distribution of the data.

- (b) Find mean, median number of leaves per branch :

No. of leaves	1	2	3	4	5	6	7	8
No of branches	5	23	34	50	98	75	4	2

4. (a) Following information regarding the two series are given below :

$$n_1 = 150 \quad \Sigma (x_i - 100) = 180 \quad \Sigma (x_i - 100)^2 = 245320$$

$$n_2 = 200 \quad \Sigma (x_i - 100) = 250 \quad \Sigma (x_i - 100)^2 = 43850$$

Compare the variability of both groups.

- (b) The first four moments about $X = 62$ are 1, 4, 10 and 46. Find first four moments about mean.

5. (a) Construct chain base indices using A. mean as average taking base 1940 :

Commodities	Years				
	1940	1941	1942	1943	1944
Wheat	2.8	3.4	3.6	4.0	4.2
Rice	10.5	10.8	10.6	11.0	11.5
Maize	2.7	3.2	3.5	3.8	4.0

- (b) Construct I-N for 1950 and 1951 from given data with current year weighted :

Commodities	Price			Quantities		
	1946	1950	1951	1946	1950	1951
A	64	75	80	270	276	290
B	40	45	41	124	118	144
C	18	18	20	130	121	137
D	25	25	56	185	267	335

6. (a) A bag contains 2 red, 3 green, 5 blue and 2 yellow balls. Find the probability that balls of all the colours are represented if a sample of four balls is selected at random.

- (b) A continuous random variable x that can assume values between $x = 2$ and $x = 5$ has

a density function given by $f(x) = \frac{2(1+x)}{27}$

Find : (i) $P(x < 4)$ (ii) $P(3 < x < 4)$

7. (a) If 10% of the parts produced by a machine are defective, determine the probability that of 4 parts chosen at random :

- (i) At most one defective. (ii) All are defective.

- (b) A box contains eight items from which three are defective. A sample of three items to be selected. Compute the probability distribution for the number of defective items. Also compute mean and variance of this distribution.