CLASS – XI (STATISTICS)

ASSIGNMENT(**HOTS**)

SECTION – A (One mark Questions)

1. The mean of 100 observations is 50 and their standard deviation is 5 . The sum of all squares of all the observations is (a) 50000 (b) 250000 (c) 252500 (d) 255 000
2. If n = 10 , $\bar{X} = 12$ and $\sum x_i^2$ = 1530, then the coefficient of variation is
   (a) 36% (b) 41% (c) 25% (d) none of these
3. The variance of n – datas is v , if each data is multiplied by a , then new variance is ------
4.

	Group – A	Group – B
Mean	2500	2500
Variance	81	100

   Which one A or B is more variable ?

SECTION – B (Two marks Questions)

5. Find the mean deviation about the median 12 of the following data

Marks obtained	10	11	12	13	14
No. of students	2	3	8	3	4

6. Calculate the coefficient of variance of the marks secured by a student in the examination as given : 82, 95, 75, 78, 87

SECTION – C (Four - marks Questions)

7. If a is a positive integer and the frequency distribution :

x_i	a	$2a$	$3a$	$4a$	$5a$	$6a$
f_i	2	1	1	1	1	1

   Has a variance of 160. Determine the value of a.

SECTION – D (Six - marks Questions)

8. Calculate mean , variance and standard deviation for the following frequency distribution:

Class	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Frequency	3	7	12	15	8	3	2

9. There are 60 students in a class . The following is the frequency distribution of marks obtained by the students in a test :

Marks	0	1	2	3	4	5
Frequency	x-2	x	x^2	$(x+1)^2$	2x	x+1

   Where x is a positive integer. Determine the mean and standard deviation of the marks.

10. The mean and standard deviation of a group of 100 observations were found to be 20 and 3 respectively. Later on it was found that three observations were incorrect, which were recorded as 21 , 21 , and 18. Find the mean and standard deviation if the incorrect observations were omitted.

Multiple Choice Questions

11. Given two data elements x and y which have values in the closed interval [1017, 1018], which of the following is always true-

A. Mean $>$ mode

B. Mean = mode

C. Median $\geq$ mode

D. None of the above

12. Given, n-1 following numbers as general term $\cos(\alpha + i\beta)$ where the value of i varies from 0 to n-2. $\cos(\alpha), \cos(\alpha + \beta), \cos(\alpha + 2\beta), \ldots, \cos(\alpha + i\beta)$. Which of the following statements about the mean of above terms is INCORRECT-

A. Mean of above terms depends on the value of i primarily

B. Mean of above terms depends on the value of α also

C. Mean of above terms is far less than the value of median of above terms

D. If α lies between $\left(0, \frac{\pi}{2}\right)$, the mean can greater than 0

13. The median of a set of 9 distinct observations is 20.5. If each of the largest 4 observations of the set is increased by 2, then the median of the new set

A. is increased by 2

B. is decreased by 2

C. is two times the original median

D. remains the same as that of the original set

14. If in an examination different weights are assigned to different subjects Physics (2), Chemistry (1), English (1), Maths (2) a student scores 60 in Physics, 70 in Chemistry, 70 in English and 80 in Maths, then weighted A.M. is

A. 60

B. 70

C. 80

D. 85

15. The price of a certain commodities keeps on changing from time to time. Here is a table given in which the price of certain commodity and its stock in a grocery store is given below. The shopkeeper wants to find the deviation in profit (Consider the mean to be his general profit without deviation),the mean being 62.

The class is the price of the commodity and frequency is the stock

Class(Price range)	Frequency(Stock)
30-40	3
40-50	7
50-60	12
60-70	15
70-80	8
80-90	3
90-100	2

A. 14.17

B. 16.19

C. 16

D. 17.89

16. There are 15 observations of x. We are given that Σx = 170 and Σx2 =2830 are the results. One of the observations, 20 was found wrong and 30 is the correct value. The correct value of the variance is

A. 178.0

B. 78.0

C. 233.8

D. 177.3

17.

Age	No. of students
4-8	3
8-12	6
12-16	4
16-20	7

Given statements:

1) Mean of above data is a prime number and can be represented as x^y where x and y are real integers.
2) Mean deviation from mean for above data is less than standard deviation.
3) Standard deviation is equal to square of the variance for above data.
4) The [SD] value for above data is 4. Where SD is standard deviation and [.] represents greatest integer function.
5) The variance for above data is not 19.
Choose the INCORRECT option-

A. Statement 4 is correct.

B. Statement 3 is correct.

C. Statement 1 and 2 are correct.

D. Statement 5 is incorrect.

18.

Age	No. of students
4-8	3
8-12	6
12-16	4
16-20	7

Analyse the statements correctly regarding given data and choose the correct option-

Statement 1: Standard deviation for given data is not equals to $\sqrt{19}$.
Statement 2: Mean deviation is less than the standard deviation and is also less than the variance.

A. Statement 1 and Statement 2 both are correct.

B. Statement 1 is incorrect, but statement 2 is correct.

C. Statement 1 is correct, but statement 2 is incorrect.

D. Statement 1 and Statement 2 both are incorrect.

19. If the mean deviation about the median of the numbers a, 2a, ... , 50a is 50, then |a| equals

A. 2

B. 3

C. 4

D. 5

20.

If C_r denotes the combination of i entities among total n entities. Given, 2n terms $C_0, C_1, C_2, \ldots C_{2n}$ and the mean of this n terms is x'.

A. $x' = \frac{2^{2n-1}}{n}$

B. $x' = \frac{2^{2n-2}}{n}$

C. $x' = \frac{2^{2n}}{n}$

$x' = (2^{2n}+1)\frac{1}{2}$

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