NCERT Class 11- Math's: Exemplar Chapter – 15 Statistics Part 4

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Question 2:

Marks Obtained	20	21	22	23	24
No. of Student					

Marks Obtained and No. Of Student

Answer:

1.25

Question 3:

Calculate the mean deviation about the mean of the set of first   natural numbers when   is an odd number.

Answer:

$$\frac{n^2 - 1}{4n}$$

Question 4:

Calculate the mean deviation about the mean of the set of first   natural numbers when   is an even number.

Answer:

$\frac{n}{4}$

Question 5:

Find the standard deviation of the first n natural numbers.

Answer:

$$\sqrt{\frac{n^2 - 1}{12}}$$

Question 6:

The mean and standard deviation of some data for the time taken to complete a test are calculated with the following results:

Number of observations $= 25$, mean $= 18.2$ seconds, standard deviation $= 3.25$ seconds.

Further, another set of 15 observations $x_1, x_2, \ldots, x_{15}$, also in seconds, is now available and we have $\sum_{i-1}^{15} x_i = 279$ and $\sum_{i-1}^{15} x_i^2 = 5524$. Calculate the standard derivation based on all 40 observations.

Answer:

3.87

Question 7:

The mean and standard deviation of a set of n_1 observations are $\overline{x_1}$ and s_1 , respectively while the mean and standard deviation of another set of n_2 observations are $\overline{x_2}$ and s_2 , respectively. Show that the standard deviation of the combined set of $(n_1 + n_2)$ observations is given by

$$S.D. = \sqrt{\frac{n_1(s_1)^2 + n_2(s_2)^2}{n_1 + n_2} + \frac{n_1 n_2 (x_1 - x_2)^2}{(n_1 + n_2)^2}}$$

Answer:

$$\sqrt{\frac{n_1(s_1)^2 + n_2(s_2)^2}{n_! + n_2} + \frac{n_1 n_2 (\overline{x_1} - \overline{x}_2)^2}{(n_1 + n_2)}}$$

Question 8:

Two sets each of 20 observations, have the same standard derivation . The first set has a mean 17 and the second a mean 22 . Determine the standard deviation of the set obtained by combining the given two sets.

Answer:

5.59

Question 9:

The frequency distribution:

	A	$2A$	$3A$	$4A$	$5A$	$6A$
			1			
Frequency						

where A is a positive integer, has a variance of 160 . Determine the value of A.

Answer:

Question 10:

For the frequency distribution:

			16	14	11	

Frequency

Find the standard distribution.

Answer:

1.38

Question 11:

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

Marks						
Frequency	$x - 2$		x^2	$(x + 1)^2$	$2x$	$x + 1$

Marks and Frequency

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

Answer:

$Mean = 2.8, SD = 1.12$

Question 12:

The mean life of a sample of 60 bulbs was 650 hours and the standard deviation was   hours. A second sample of 80 bulbs has a mean life of 660 hours and standard deviation   hours. Find the overall standard deviation.

Answer:

8.9