

NCERT Solutions for Class 9 Maths Chapter 12 Statistics Ex 12.3

Question 1.

The following number of goals were scored by a team in a series of 10 matches:

2, 3, 4, 5, 0, 1, 3, 3, 4, 3

Find the mean, median and mode of these scores.

Solution.

Given data is:

2, 3, 4, 5, 0, 1, 3, 3, 4, 3

(i) Mean:

$$\begin{aligned} &= \frac{\text{Sum of all the goals}}{\text{Total number of goals}} \\ &= \frac{2+3+4+5+1+0+3+3+4+3}{10} \end{aligned}$$

$$= \frac{28}{10}$$

$$= 2.8$$

Hence, mean of the given data is 2.8

(ii) Median:

In order to find the mean of the given data, we will arrange the data in ascending order:

0, 1, 2, 3, 3, 3, 3, 4, 4, 5

Total number of data = 10

Now,

$$\text{Median} = \frac{[(\frac{10}{2})\text{th value} + \{(\frac{10}{2}) + 1\}\text{th value}]}{2}$$

$$= \frac{5\text{th value} + 6\text{th value}}{2}$$

$$= \frac{3+3}{2}$$

$$= \frac{6}{2}$$

$$= 3$$

Hence, the median of the following data is 3.

(iii) Mode:

Since, 3 occur most of the times that is 4 times.

Hence, mode of the provided data is 3.

Question 2.

In a mathematics test given to 15 students, the following marks (out of 100) are recorded:

41, 39, 48, 52, 46, 62, 54, 40, 96, 52, 98, 40, 42, 52, 60

Find the mean, median and mode of this data.

Solution.

Mean:

Using $\bar{x} = \frac{x_1 + x_2 + \dots + x_{15}}{15}$, the mean is:

$$\bar{x} = \frac{41 + 39 + 48 + 52 + 46 + 62 + 54 + 40 + 96}{15}$$

$$\bar{x} = \frac{822}{15}$$

$$\bar{x} = 54.8$$

(ii) Median:

To find the median, arrange the given data in ascending order, as follows:

39, 40, 40, 41, 42, 46, 48, 52, 52, 52, 54, 60, 62, 96, 98

Since, the number of terms is 15, an odd number, we find out the median by finding the marks obtained by $\left(\frac{15+1}{2}\right)$ the student, which is 8th student.

Therefore, the median marks will be 52.

(iii) Again, the data 52 occurs most frequently that is, three times.

Hence, the mode of the given data would be 52.

Question 3.

The following observations have been arranged in ascending order. If the median of the data is 63, find the value of x.

29, 32, 48, 50, x, x + 2, 72, 78, 84, 95

Solution.

The given data arranged in ascending order is as

29, 32, 48, 50, x, x+2, 72, 78, 84, 95

There are 10 terms.

So, there are two middle terms that are:

The $\left(\frac{10}{2}\right)^{th}$ and $\left(\frac{10}{2} + 1\right)^{th}$

That is the 5th and 6th terms.

Hence, the median is the mean of the values of the 5th and 6th terms.

Therefore,

$$\text{Median} = \frac{x + (x + 2)}{2} = x + 1$$

But median = 63 (Given)

Therefore,

$$x + 1 = 63$$

$$x = 63 - 1 = 62$$

Question 4.

Find the mode of 14, 25, 14, 28, 18, 17, 18, 14, 23, 22, 14, 18

Solution.

Arranging the given data in ascending order as follows, we get:

14, 14, 14, 14, 17, 18, 18, 18, 22, 23, 25, 28

Here,

14 occur most frequently that is 4 times

Hence, the mode of the given data is 14

Question 5.

Find the mean salary of 60 workers of a factory from the following table:

Salary (in Rs)	Number of workers
3000	16
4000	12
5000	10
6000	8
7000	6
8000	4
9000	3

10000	1
Total	60

Solution.

Calculation of mean:

Salary (in Rs) X_i	No. of workers (f_i)	($f_i x_i$)
3000	16	48000
4000	12	48000
5000	10	50000
6000	8	48000
7000	6	42000
8000	4	32000
9000	3	27000
10000	1	10000
	$\sum f_i = 60$	$\sum f_i x_i = 305000$

Therefore,

$$\text{Mean} = \frac{\sum f_i X_i}{\sum f_i} = \frac{305000}{60} = 5083.33$$

Thus, mean salary of 60 workers is Rs 5083.33(approx)

Question 6.

Give one example of a situation in which

- (i) The mean is an appropriate measure of central tendency.
- (ii) The mean is not an appropriate measure of central tendency but the median is an appropriate measure of central tendency.

Solution.

- (i) The mean is an appropriate measure because of its unique value and can be used to compare different groups of data
- (ii) For the measurement of qualitative characteristics. For instance say beauty, honesty, intelligence etc., mean cannot be used

