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Class 11 commerce Sub. ECO/B Date 28.12.2020

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## Median

### Ex 15.1 Class 11 Maths Question 1.

4, 7, 8, 9, 10, 12, 13, 17

#### Solution:

Mean of the given data is

$$\bar{x} = \frac{4+7+8+9+10+12+13+17}{8} = \frac{80}{8} = 10$$

$x_i$	$ x_i - 10 $
4	6
7	3
8	2
9	1
10	0
12	2
13	3
17	7
Total	24

$$\therefore \text{M.D. about mean} = \frac{1}{n} \sum_{i=1}^n |x_i - \bar{x}| = \frac{1}{8} \times 24 = 3$$

### Ex 15.1 Class 11 Maths Question 2.

38, 70, 48, 40, 42, 55, 63, 46, 54, 44

**Solution:**

Mean of the given data is

$$\bar{x} = \frac{38+70+48+40+42+55+63+46+54+44}{10}$$

$$= \frac{500}{10} = 50$$

$x_i$	$ x_i - 50 $
38	12
70	20
48	2
40	10
42	8
55	5
63	13
46	4
54	4
44	6
Total	84

$$\therefore \text{M.D. about mean} = \frac{1}{n} \sum_{i=1}^n |x_i - \bar{x}| = \frac{1}{10} \times 84 = 8.4$$

**Ex 15.1 Class 11 Maths Question 3.**

13, 17, 16, 14, 11, 13, 10, 16, 11, 18, 12, 17

**Solution:**

Arranging the data in ascending order, we have

10, 11, 11, 12, 13, 13, 14, 16, 16, 17, 17, 18

Here  $n = 12$  (which is even)

So median is the average of 6th and 7th observations

$$\therefore \text{Median } (M) = \frac{13+14}{2} = \frac{27}{2} = 13.5$$

$x_i$	$ x_i - 13.5 $
10	3.5
11	2.5
11	2.5
12	1.5
13	0.5
13	0.5
14	0.5
16	2.5
16	2.5
17	3.5
17	3.5
18	4.5
<b>Total</b>	<b>28</b>

$$\begin{aligned} \therefore \text{M.D. about median} &= \frac{1}{n} \sum_{i=1}^n |x_i - M| \\ &= \frac{1}{12} \times 28 = 2.33 \end{aligned}$$