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शक्तिउत्थानआश्रमलखीसरायबिहार

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## Ex 15.1 Class 11 Maths Question 10.

| Height (in cms) | Number of boys |
|-----------------|----------------|
| 95 – 105        | 9              |
| 105 – 115       | 13             |
| 115 – 125       | 26             |
| 125 – 135       | 30             |
| 135 – 145       | 12             |
| 145 – 155       | 10             |

### Solution:

| Height (in cms) | Mid values $x_i$ | $f_i$ | $f_i x_i$ | $ x_i - 125.3 $ | $f_i  x_i - 125.3 $ |
|-----------------|------------------|-------|-----------|-----------------|---------------------|
| 95 – 105        | 100              | 9     | 900       | 25.3            | 227.7               |
| 105 – 115       | 110              | 13    | 1430      | 15.3            | 198.9               |
| 115 – 125       | 120              | 26    | 3120      | 5.3             | 137.8               |
| 125 – 135       | 130              | 30    | 3900      | 4.7             | 141                 |
| 135 – 145       | 140              | 12    | 1680      | 14.7            | 176.4               |
| 145 – 155       | 150              | 10    | 1500      | 24.7            | 247                 |
|                 |                  | 100   | 12530     |                 | 1128.8              |

$$\text{Mean } (\bar{x}) = \frac{1}{N} \sum_{i=1}^n f_i x_i = \frac{1}{100} \times 12530 = 125.3$$

Mean deviation about mean

$$= \frac{1}{N} \sum_{i=1}^n f_i |x_i - \bar{x}| = \frac{1}{100} \times 1128.8 = 11.28$$

## Ex 15.1 Class 11 Maths Question 11.

Find the mean deviation about median for the following data:

| Marks   | Number of girls |
|---------|-----------------|
| 0 – 10  | 6               |
| 10 – 20 | 8               |
| 20 – 30 | 14              |
| 30 – 40 | 16              |
| 40 – 50 | 4               |
| 50 – 60 | 2               |

**Solution:**

| Marks   | Mid values $x_i$ | $f_i$ | c.f. | $ x_i - 27.86 $ | $f_i  x_i - 27.86 $ |
|---------|------------------|-------|------|-----------------|---------------------|
| 0 – 10  | 5                | 6     | 6    | 22.86           | 137.16              |
| 10 – 20 | 15               | 8     | 14   | 12.86           | 102.88              |
| 20 – 30 | 25               | 14    | 28   | 2.86            | 40.04               |
| 30 – 40 | 35               | 16    | 44   | 7.14            | 114.24              |
| 40 – 50 | 45               | 4     | 48   | 17.14           | 68.56               |
| 50 – 60 | 55               | 2     | 50   | 27.14           | 54.28               |
|         |                  | 50    |      |                 | 517.16              |

$$\text{Here, } \frac{N}{2} = \frac{50}{2} = 25$$

$\therefore$  Median class is 20 – 30

$$\text{Median}(M) = 20 + \frac{25 - 14}{14} \times 10 = 20 + 7.86 = 27.86$$

$$\begin{aligned} \therefore \text{M.D. about median} &= \frac{1}{N} \sum_{i=1}^n f_i |x_i - M| \\ &= \frac{1}{50} \times 517.16 = 10.34 \end{aligned}$$