

**RD Sharma**  
**Solutions**  
**Class 11 Maths**  
**Chapter 32**  
**Ex 32.2**

## Statistics Ex 32.2 Q1

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| $x_i$ | $f_i$ | <i>Cum. Freq</i> | $ d_i  =  x_i - 61 $ | $f_i  d_i $ |
|-------|-------|------------------|----------------------|-------------|
| 58    | 15    | 15               | 3                    | 45          |
| 59    | 20    | 35               | 2                    | 40          |
| 60    | 32    | 67               | 1                    | 32          |
| 61    | 35    | 102              | 0                    | 0           |
| 62    | 35    | 137              | 1                    | 35          |
| 63    | 22    | 159              | 2                    | 44          |
| 64    | 20    | 179              | 3                    | 60          |
| 65    | 10    | 189              | 4                    | 40          |
| 66    | 8     | 197              | 5                    | 40          |

$N = 197$

*Total* = 336

$$N = 197, \frac{N}{2} = 98.5$$

Corresponding value for median is 61

$$\text{Mean Deviation} = \frac{336}{197} = 1.705$$

## Statistics Ex 32.2 Q2

We have to calculate mean deviation from the median. So, first we calculate the median.

| x | f   | cf  | d = (x-med) | fd  |
|---|-----|-----|-------------|-----|
| 0 | 14  | 14  | 4           | 56  |
| 1 | 21  | 35  | 3           | 63  |
| 2 | 25  | 60  | 2           | 50  |
| 3 | 43  | 103 | 1           | 43  |
| 4 | 51  | 154 | 0           | 0   |
| 5 | 40  | 194 | 1           | 40  |
| 6 | 39  | 233 | 2           | 78  |
| 7 | 12  | 245 | 3           | 36  |
|   | 245 |     |             | 366 |

We have  $N = 245 \Rightarrow N/2 = 122.5$

The cumulative frequency just greater than  $N/2$  is 154 and the corresponding value of  $x$  is 4.

Hence, median = 4

$$\therefore \text{M.D} = \frac{1}{n} \sum f_i |x_i - m| = \frac{1}{245} [366] = 1.49$$

| $x_i$ | $f_i$ | Cum. fre | $ d_i  =  x_i - 13 $ | $f_i  d_i $ |
|-------|-------|----------|----------------------|-------------|
| 5     | 2     | 2        | 8                    | 16          |
| 7     | 4     | 6        | 6                    | 24          |
| 9     | 6     | 12       | 4                    | 24          |
| 11    | 8     | 20       | 2                    | 16          |
| 13    | 10    | 30       | 0                    | 0           |
| 15    | 12    | 42       | 2                    | 24          |
| 17    | 8     | 50       | 4                    | 32          |

$N = 50$

Total = 136

$$\frac{N}{2} = 25$$

Value corresponding to 25 is Median = 13

$$\text{M.D} = \frac{136}{50} = 2.72$$

### Statistics Ex 32.2 Q4(i)

| $x_i$ | $f_i$ | $f_i x_i$   | $ d_i  =  x_i - 9 $ | $f_i  d_i $ |
|-------|-------|-------------|---------------------|-------------|
| 5     | 8     | 40          | 4                   | 32          |
| 7     | 6     | 42          | 2                   | 12          |
| 9     | 2     | 18          | 0                   | 0           |
| 10    | 2     | 20          | 1                   | 2           |
| 12    | 2     | 24          | 3                   | 6           |
| 15    | 6     | 90          | 6                   | 36          |
|       | 26    | Total = 234 |                     | Total = 88  |

$$\frac{\sum f_i x_i}{26} = 9$$

Mean = 9

$$\text{M.D} = \frac{88}{26} \approx 3.39$$

### Statistics Ex 32.2 Q4(ii)

| x  | f  | xf  | d = (x - mean) | fd  |
|----|----|-----|----------------|-----|
| 5  | 7  | 35  | 9              | 63  |
| 10 | 4  | 40  | 4              | 16  |
| 15 | 6  | 90  | 1              | 6   |
| 20 | 3  | 60  | 6              | 18  |
| 25 | 5  | 125 | 11             | 55  |
|    | 25 | 350 |                | 158 |

$$\text{Mean} = \frac{1}{n} \sum f_i x_i = \frac{350}{25} = 14$$

$$\therefore \text{M.D} = \frac{1}{n} \sum f_i |d_i| = \frac{1}{25} [158] = 6.32$$

### Statistics Ex 32.2 Q4(iii)

| x  | f  | xf   | d=(x-mean) | fd   |
|----|----|------|------------|------|
| 10 | 4  | 40   | 40         | 160  |
| 30 | 24 | 720  | 20         | 480  |
| 50 | 28 | 1400 | 0          | 0    |
| 70 | 16 | 1120 | 20         | 320  |
| 90 | 8  | 720  | 40         | 320  |
|    | 80 | 4000 |            | 1280 |

$$\text{Mean} = \frac{1}{n} \sum f_i x_i = \frac{4000}{80} = 50$$

$$\therefore \text{M.D} = \frac{1}{n} \sum f_i |d_i| = \frac{1}{80} [1280] = 16$$

### Statistics Ex 32.2 Q4(iv)

| $x_i$ | $f_i$ | $f_i x_i$   | $ d_i  =  x_i - 21.65 $ | $f_i  d_i $ |
|-------|-------|-------------|-------------------------|-------------|
| 20    | 6     | 120         | 1.65                    | 9.9         |
| 21    | 4     | 84          | 0.65                    | 2.6         |
| 22    | 5     | 110         | 0.35                    | 1.75        |
| 23    | 1     | 23          | 1.35                    | 1.35        |
| 24    | 4     | 96          | 2.35                    | 9.40        |
|       | 20    | Total = 433 |                         | Total = 25  |

$$\frac{\sum f_i x_i}{20} = 21.65$$

$$\text{Mean} = 21.65$$

$$\text{M.D} = \frac{25}{20} \approx 1.25$$

### Statistics Ex 32.2 Q5

| $x_i$ | $f_i$ | Cum Freq | $ d_i  =  x_i - 30 $ | $f_i  d_i $ |
|-------|-------|----------|----------------------|-------------|
| 15    | 3     | 3        | 15                   | 45          |
| 21    | 5     | 8        | 9                    | 45          |
| 27    | 6     | 14       | 3                    | 18          |
| 30    | 7     | 21       | 0                    | 0           |
| 35    | 8     | 29       | 5                    | 40          |
|       | 29    |          |                      | Total = 148 |

$$\frac{N}{2} = 14.5$$

Median = 30

$$M.D = \frac{148}{29} \approx 5.10$$

We have to calculate mean deviation from the median. So, first we calculate the median.

| x  | f  | cf | d=(x-med) | fd  |
|----|----|----|-----------|-----|
| 35 | 4  | 4  | 39        | 156 |
| 42 | 2  | 6  | 32        | 64  |
| 54 | 4  | 10 | 20        | 80  |
| 74 | 20 | 30 | 0         | 0   |
| 89 | 12 | 42 | 15        | 180 |
| 91 | 5  | 47 | 17        | 85  |
| 94 | 3  | 50 | 20        | 60  |
|    | 50 |    |           | 625 |

We have  $N = 50 \Rightarrow N/2 = 25$

The cumulative frequency just greater than  $N/2$  is 30 and the corresponding value of  $x$  is 74.

Hence, median = 74

$$\therefore M.D = \frac{1}{n} \sum f_i |d_i| = \frac{1}{50} [625] = 12.5$$

| $x_i$ | $f_i$ | Cum Freq | $ d_i  =  x_i - 12 $ | $f_i  d_i $ |
|-------|-------|----------|----------------------|-------------|
| 10    | 2     | 2        | 2                    | 4           |
| 11    | 3     | 5        | 1                    | 3           |
| 12    | 8     | 13       | 0                    | 0           |
| 14    | 3     | 16       | 2                    | 6           |
| 15    | 4     | 20       | 3                    | 12          |
|       | 20    |          |                      | Total = 25  |

$$\frac{N}{2} = 10$$

Median = 12

$$M.D = \frac{25}{20} \approx 1.25$$