

**RD Sharma Solutions Class 10 Maths Chapter 7 Exercise 7.4:** Chapter 7 of RD Sharma's Class 10 Maths book delves into Statistics, with Exercise 7.4 focusing on measures of central tendency, specifically the mean, median, and mode of grouped data. The exercise teaches students methods to compute these values efficiently using class intervals and frequencies.

Topics covered include calculating the mean using the direct, assumed mean, and step-deviation methods; finding the median by locating the cumulative frequency; and determining the mode by using the modal class. These concepts help students understand data summarization and interpretation, enhancing their skills in handling real-life statistical data.

## **RD Sharma Solutions Class 10 Maths Chapter 7 Exercise 7.4 Overview**

Chapter 7, Exercise 7.4 of RD Sharma's Class 10 Maths book focuses on Statistics, specifically on calculating measures of central tendency like mean, median, and mode. These concepts are essential for students as they form the basis for data interpretation, analysis, and real-life applications such as surveys and predictions.

This exercise helps build a strong foundation in understanding data distribution and variability, which is crucial for advanced studies in mathematics, economics, and science. By solving these questions, students gain proficiency in handling data systematically, preparing them for competitive exams and practical applications in various fields.

## **RD Sharma Solutions Class 10 Maths Chapter 7 Exercise 7.4 Statistics**

Below is the RD Sharma Solutions Class 10 Maths Chapter 7 Exercise 7.4 Statistics -

**1. Following are the lives in hours of 15 pieces of the components of aircraft engine. Find the median:**

**715, 724, 725, 710, 729, 745, 694, 699, 696, 712, 734, 728, 716, 705, 719.**

**Solution:**

Arranging the given data in ascending order, we have

694, 696, 699, 705, 710, 712, 715, 716, 719, 721, 725, 728, 729, 734, 745

As the number of terms is an odd number, i.e.,  $N = 15$

We use the following procedure to find the median.

$$\text{Median} = (N + 1)/2^{\text{th}} \text{ term}$$

$$= (15 + 1)/2^{\text{th}} \text{ term}$$

$$= 8^{\text{th}} \text{ term}$$

So, the 8<sup>th</sup> term in the arranged order of the given data should be the median.

Therefore, 716 is the median of the data.

**2. The following is the distribution of height of students of a certain class in a certain city:**

<b>Height (in cm):</b>	<b>160 – 162</b>	<b>163 – 165</b>	<b>166 – 168</b>	<b>169 – 171</b>	<b>172 – 174</b>
<b>No of students:</b>	<b>15</b>	<b>118</b>	<b>142</b>	<b>127</b>	<b>18</b>

**Find the median height.**

**Solution:**

Class interval (exclusive)	Class interval (inclusive)	Class interval frequency	Cumulative frequency
160 – 162	159.5 – 162.5	15	15
163 – 165	162.5 – 165.5	118	133(F)
166 – 168	165.5 – 168.5	142(f)	275
169 – 171	168.5 – 171.5	127	402
172 – 174	171.5 – 174.5	18	420
N = 420			

Here, we have  $N = 420$ ,

$$\text{So, } N/2 = 420/2 = 210$$

The cumulative frequency just greater than  $N/2$  is 275 then 165.5 – 168.5 is the median class such that

$L = 165.5$ ,  $f = 142$ ,  $F = 133$  and  $h = (168.5 - 165.5) = 3$

$$\text{Median} = L + \frac{\frac{N}{2} - F}{f} \times h$$

$$= 165.5 + \frac{210 - 133}{142} \times 3$$

$$= 165.5 + \frac{77}{142} \times 3$$

$$= 165.5 + \frac{231}{142}$$

$$= 165.5 + 1.63$$

$$= 167.13$$

**3. Following is the distribution of I.Q. of 100 students. Find the median I.Q.**

<b>I.Q:</b>	<b>55 – 64</b>	<b>65 – 74</b>	<b>75 – 84</b>	<b>85 – 94</b>	<b>95 – 104</b>	<b>105 – 114</b>	<b>115 – 124</b>	<b>125 – 134</b>	<b>135 – 144</b>
<b>No of students:</b>	<b>1</b>	<b>2</b>	<b>9</b>	<b>22</b>	<b>33</b>	<b>22</b>	<b>8</b>	<b>2</b>	<b>1</b>

**Solution:**

Class interval (exclusive)	Class interval (inclusive)	Class interval frequency	Cumulative frequency
55 – 64	54.5 – 64.5	1	1
65 – 74	64.5 – 74.5	2	3
75 – 84	74.5 – 84.5	9	12
85 – 94	84.5 – 94.5	22	34(F)
95 – 104	94.5 – 104.5	33(f)	67
105 – 114	104.5 – 114.5	22	89
115 – 124	114.5 – 124.5	8	97

125 – 134	124.5 – 134.5	2	98
135 – 144	134.5 – 144.5	1	100
N = 100			

Here, we have N = 100,

So,  $N/2 = 100/2 = 50$

The cumulative frequency just greater than  $N/2$  is 67 then the median class is (94.5 – 104.5) such that L = 94.5, F = 33, h = (104.5 – 94.5) = 10

$$\text{Median} = L + \frac{\frac{N}{2} - F}{f} \times h$$

$$= 94.5 + \frac{50 - 34}{33} \times 10$$

$$= 94.5 + 4.85$$

$$= 99.35$$

**4. Calculate the median from the following data:**

<b>Rent (in Rs):</b>	<b>15 – 25</b>	<b>25 – 35</b>	<b>35 – 45</b>	<b>45 – 55</b>	<b>55 – 65</b>	<b>65 – 75</b>	<b>75 – 85</b>	<b>85 – 95</b>
<b>No of houses:</b>	<b>8</b>	<b>10</b>	<b>15</b>	<b>25</b>	<b>40</b>	<b>20</b>	<b>15</b>	<b>7</b>

**Solution:**

Class interval	Frequency	Cumulative frequency
15 – 25	8	8
25 – 35	10	18
35 – 45	15	33
45 – 55	25	58(F)
55 – 65	40(f)	98

65 – 75	20	118
75 – 85	15	133
85 – 95	7	140

$$N = 140$$

Here, we have  $N = 140$ ,

$$\text{So, } N/2 = 140/2 = 70$$

The cumulative frequency just greater than  $N/2$  is 98 then the median class is 55 – 65 such that  $L = 55$ ,  $f = 40$ ,  $F = 58$ ,  $h = 65 - 55 = 10$

$$\text{Median} = L + \frac{\frac{N}{2} - F}{f} \times h$$

$$= 55 + \frac{70 - 58}{40} \times 10$$

$$= 55 + 3 = 58$$

**5. Calculate the median from the following data:**

<b>Marks below:</b>	<b>10 – 20</b>	<b>20 – 30</b>	<b>30 – 40</b>	<b>40 – 50</b>	<b>50 – 60</b>	<b>60 – 70</b>	<b>70 – 80</b>	<b>85 – 95</b>
<b>No of students:</b>	<b>15</b>	<b>35</b>	<b>60</b>	<b>84</b>	<b>96</b>	<b>127</b>	<b>198</b>	<b>250</b>

**Solution:**

Marks below	No. of students	Class interval	Frequency	Cumulative frequency
10	15	0 – 10	15	15
20	35	10 – 20	20	35
30	60	20 – 30	25	60
40	84	30 – 40	24	84
50	96	40 – 50	12	96(F)

60	127	50 – 60	31(f)	127
70	198	60 – 70	71	198
80	250	70 – 80	52	250

$$N = 250$$

Here, we have  $N = 250$ ,

$$\text{So, } N/2 = 250/2 = 125$$

The cumulative frequency just greater than  $N/2$  is 127, then the median class is 50 – 60 such that  $L = 50$ ,  $f = 31$ ,  $F = 96$ ,  $h = 60 - 50 = 10$

$$\text{Median} = L + \frac{\frac{N}{2} - F}{f} \times h$$

$$= 50 + \frac{125 - 96}{31} \times 10$$

$$= 50 + 9.35$$

$$= 59.35$$

**6. Calculate the missing frequency from the following distribution, it being given that the median of the distribution is 24.**

<b>Age in years:</b>	<b>0 – 10</b>	<b>10 – 20</b>	<b>20 – 30</b>	<b>30 – 40</b>	<b>40 – 50</b>
<b>No of persons:</b>	<b>5</b>	<b>25</b>	<b>?</b>	<b>18</b>	<b>7</b>

**Solution:**

Let the unknown frequency be taken as  $x$ ,

Class interval	Frequenc y	Cumulative frequency
0 – 10	5	5
10 – 20	25	30(F)

20 – 30	x (f)	30 + x
30 – 40	18	48 + x
40 – 50	7	55 + x
N = 170		

It's given that

Median = 24

Then, median class = 20 – 30; L = 20, h = 30 - 20 = 10, f = x, F = 30

$$\text{Median} = L + \frac{\frac{N}{2} - F}{f} \times h$$

$$24 = 20 + \frac{\frac{55 + x}{2} - 30}{x} \times 10$$

$$24 - 20 = \frac{\frac{55 + x}{2} - 30}{x} \times 10$$

$$4x = \left( \frac{55 + x}{2} - 30 \right) \times 10$$

$$4x = 275 + 5x - 300$$

$$4x - 5x = - 25$$

$$- x = - 25$$

$$x = 25$$

Therefore, the Missing frequency = 25

**7. The following table gives the frequency distribution of married women by age at marriage.**

Age (in years)	Frequenc y	Age (in years)	Frequenc y
----------------	---------------	----------------	---------------

15 – 19	53	40 – 44	9
20 – 24	140	45 – 49	5
25 – 29	98	45 – 49	3
30 – 34	32	55 – 59	3
35 – 39	12	60 and above	2

Calculate the median and interpret the results.

**Solution:**

Class interval (exclusive)	Class interval (inclusive)	Frequency	Cumulative frequency
15 – 19	14.5 – 19.5	53	53 (F)
20 – 24	19.5 – 24.5	140 (f)	193
25 – 29	24.5 – 29.5	98	291
30 – 34	29.5 – 34.5	32	323
35 – 39	34.5 – 39.5	12	335
40 – 44	39.5 – 44.5	9	344
45 – 49	44.5 – 49.5	5	349
50 – 54	49.5 – 54.5	3	352
55 – 54	54.5 – 59.5	3	355
60 and above	59.5 and above	2	357

N = 357

Here, we have N = 357,

So,  $N/2 = 357/2 = 178.5$

The cumulative frequency just greater than  $N/2$  is 193, so then the median class is (19.5 – 24.5) such that  $l = 19.5$ ,  $f = 140$ ,  $F = 53$ ,  $h = 25.5 - 19.5 = 5$



$$\text{Median} = l + \frac{\frac{N}{2} - F}{f} \times h$$

$$\text{Median} = 19.5 + \frac{178.5 - 53}{140} \times 5$$

$$\text{Median} = 23.98$$

This means nearly half the women were married between the ages of 15 and 25

**8. The following table gives the distribution of the life time of 400 neon lamps:**

Life time: (in hours)	Number of lamps
1500 – 2000	14
2000 – 2500	56
2500 – 3000	60
3000 – 3500	86
3500 – 4000	74
4000 – 4500	62
4500 – 5000	48

**Find the median life.**

**Solution:**

Life time	Number of lamps fi	Cumulative frequency (cf)
1500 – 2000	14	14
2000 – 2500	56	70
2500 – 3000	60	130(F)
3000 – 3500	86(f)	216

3500 – 4000	74	290
4000 – 4500	62	352
4500 – 5000	48	400

$$N = 400$$

It's seen that the cumulative frequency just greater than  $n/2$  ( $400/2 = 200$ ) is 216, and it belongs to the class interval 3000 – 3500, which becomes the Median class = 3000 – 3500

Lower limits (l) of median class = 3000 and,

Frequency (f) of median class = 86

Cumulative frequency (cf) of class preceding median class = 130

And the Class size (h) = 500

Thus, by calculating the median by the formula, we get

$$\begin{aligned}\text{Median} &= l + \left( \frac{\frac{n}{2} - cf}{f} \right) \times h \\ &= 3000 + \left( \frac{200 - 130}{86} \right) \times 500\end{aligned}$$

$$= 3000 + (35000/86)$$

$$= 3406.98$$

Thus, the median lifetime of lamps is 3406.98 hours

**9. The distribution below gives the weight of 30 students in a class. Find the median weight of students:**

<b>Weight (in kg):</b>	<b>40 – 45</b>	<b>45 – 50</b>	<b>50 – 55</b>	<b>55 – 60</b>	<b>60 – 65</b>	<b>65 – 70</b>	<b>70 – 75</b>
<b>No of students:</b>	<b>2</b>	<b>3</b>	<b>8</b>	<b>6</b>	<b>6</b>	<b>3</b>	<b>2</b>

**Solution:**

Weight (in kg)	Number of students $f_i$	Cumulative frequency (cf)
40 – 45	2	2
45 – 50	3	5
50 – 55	8	13
55 – 60	6	19
60 – 65	6	25
65 – 70	3	28
70 – 75	2	30

It's seen that the cumulative frequency just greater than  $n/2$  (i.e.  $30/2 = 15$ ) is 19, belongs to class interval 55 – 60.

So, it's chosen that

Median class = 55 – 60

Lower limit (l) of median class = 55

Frequency (f) of median class = 6

Cumulative frequency (cf) = 13

And, Class size (h) = 5

Thus, by calculating the median by the formula, we get

$$\text{Median} = l + \left( \frac{\frac{n}{2} - cf}{f} \right) \times h$$

$$= 55 + \left( \frac{15 - 13}{6} \right) \times 5$$

$$= 55 + 10/6 = 56.666$$

So, the median weight is 56.67 kg.

**10. Find the missing frequencies and the median for the following distribution if the mean is 1.46**

<b>No. of accidents:</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>Total</b>
<b>Frequencies (no. of days):</b>	<b>46</b>	<b>?</b>	<b>?</b>	<b>25</b>	<b>10</b>	<b>5</b>	<b>200</b>

**Solution:**

No. of accidents (x)	No. of days (f)	fx
0	46	0
1	x	x
2	y	2y
3	25	75
4	10	40
5	5	25
	N = 200	Sum = x + 2y + 140

It's given that N = 200

$$\Rightarrow 46 + x + y + 25 + 10 + 5 = 200$$

$$\Rightarrow x + y = 200 - 46 - 25 - 10 - 5$$

$$\Rightarrow x + y = 114 \text{ --- (i)}$$

And also given, Mean = 1.46

$$\Rightarrow \text{Sum} / N = 1.46$$

$$\Rightarrow (x + 2y + 140) / 200 = 1.46$$

$$\Rightarrow x + 2y = 292 - 140$$

$$\Rightarrow x + 2y = 152 \text{ --- (ii)}$$

Subtract equation (i) from equation (ii), and we get

$$x + 2y - x - y = 152 - 114$$

$$\Rightarrow y = 38$$

Now, on putting the value of  $y$  in equation (i), we find  $x = 114 - 38 = 76$

Thus, the table becomes:

No. of accidents (x)	No. of days (f)	Cumulative frequency
0	46	46
1	76	122
2	38	160
3	25	185
4	10	195
5	5	200
N = 200		

It's seen that,

$$N = 200 \quad N/2 = 200/2 = 100$$

So, the cumulative frequency just more than  $N/2$  is 122

Therefore, the median is 1.

## Benefits of Solving RD Sharma Solutions Class 10 Maths Chapter 7 Exercise 7.4

Solving RD Sharma Solutions for Class 10 Maths, Chapter 7 (Statistics), Exercise 7.4 offers multiple benefits:

**In-Depth Understanding of Statistics Concepts:** This exercise covers key statistical concepts such as mean, median, and mode, helping students to understand their applications and calculations thoroughly.

**Improves Problem-Solving Skills:** By working through these solutions, students enhance their analytical and problem-solving skills, learning different methods to approach statistical problems effectively.

**Clarification of Step-by-Step Methods:** RD Sharma's solutions provide detailed, step-by-step explanations for each question, which is particularly helpful for students in grasping the sequential approach to solving complex statistical problems.

**Preparation for Exams:** These exercises closely align with CBSE exam patterns, helping students to get accustomed to the types of questions that may appear in their exams, ultimately boosting confidence and preparedness.

**Practice in Data Interpretation:** The exercise focuses on data interpretation skills, which are crucial not only for exams but also for real-world applications where statistical data is essential.

**Builds Speed and Accuracy:** Regular practice with RD Sharma solutions helps students improve their calculation speed and accuracy, both essential for handling time constraints in exams.