

**RD Sharma Solutions Class 10 Maths Chapter 7 Exercise 7.5:** In Chapter 7, Exercise 7.5 of RD Sharma's Class 10 Maths, students delve into key concepts in statistics. This exercise focuses on understanding and calculating the cumulative frequency and cumulative frequency distribution.

Students learn methods to organize data effectively and understand frequency distributions, enabling them to handle grouped and ungrouped data. They also gain skills in finding the median, mean, and mode of data sets, with practical examples reinforcing the application of formulas. This exercise is essential for developing a statistical foundation, as it equips students with tools to interpret and analyze data effectively, a crucial skill for various real-world scenarios.

## **RD Sharma Solutions Class 10 Maths Chapter 7 Exercise 7.5 Overview**

Chapter 7, Exercise 7.5 in RD Sharma's Class 10 Maths book focuses on Statistics, an essential branch of mathematics that deals with data collection, analysis, interpretation, and presentation. This exercise helps students grasp core statistical concepts such as mean, median, mode, and range, which are foundational for understanding data trends and making informed decisions.

The importance of these concepts lies in their widespread application in real-world scenarios, including economics, social sciences, business, and even daily life. Understanding statistics enhances analytical skills, enabling students to interpret data accurately and solve problems methodically, an invaluable skill set for higher studies and various career fields.

## **RD Sharma Solutions Class 10 Maths Chapter 7 Exercise 7.5 Statistics**

Below is the RD Sharma Solutions Class 10 Maths Chapter 7 Exercise 7.5 Statistics -

**1. Find the mode of the following data:**

**(i) 3, 5, 7, 4, 5, 3, 5, 6, 8, 9, 5, 3, 5, 3, 6, 9, 7, 4**

**(ii) 3, 3, 7, 4, 5, 3, 5, 6, 8, 9, 5, 3, 5, 3, 6, 9, 7, 4**

**(iii) 15, 8, 26, 25, 24, 15, 18, 20, 24, 15, 19, 15**

**Solution:**

**(i)**

Value (x)	3	4	5	6	7	8	9
Frequency (f)	4	2	5	2	2	1	2

Thus, the mode = 5 since it occurs the maximum number of times.

(ii)

Value (x)	3	4	5	6	7	8	9
Frequency (f)	5	2	4	2	2	1	2

Thus, the mode = 3 since it occurs the maximum number of times.

(iii)

Value (x)	8	15	18	19	20	24	25
Frequency (f)	1	4	1	1	1	2	1

Thus, the mode = 15 since it occurs the maximum number of times.

**2. The shirt size worn by a group of 200 persons, who bought the shirt from a store, are as follows:**

<b>Shirt size:</b>	<b>37</b>	<b>38</b>	<b>39</b>	<b>40</b>	<b>41</b>	<b>42</b>	<b>43</b>	<b>44</b>
<b>Number of persons:</b>	<b>15</b>	<b>25</b>	<b>39</b>	<b>41</b>	<b>36</b>	<b>17</b>	<b>15</b>	<b>12</b>

**Find the model shirt size worn by the group.**

**Solution:**

Shirt size:	37	38	39	40	41	42	43	44
Number of persons:	15	25	39	41	36	17	15	12

From the data, it is observed that,

Model shirt size = 40 since it was the size which occurred for the maximum number of times.

**3. Find the mode of the following distribution.**

(i)

<b>Class interval:</b>	<b>0 – 10</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>Frequency:</b>	<b>5</b>	<b>8</b>	<b>7</b>	<b>12</b>	<b>28</b>	<b>20</b>	<b>10</b>	<b>10</b>

**Solution:**

Class interval:	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80
Frequency:	5	8	7	12	28	20	10	10

It's seen that the maximum frequency is 28.

So, the corresponding class, i.e. 40 – 50, is the modal class.

And,

$$l = 40, h = 50 - 40 = 10, f = 28, f_1 = 12, f_2 = 20$$

Using the formula for finding mode, we get

$$\begin{aligned} \text{Mode} &= l + \frac{f - f_1}{2f - f_1 - f_2} \times h \\ &= 40 + \frac{28 - 12}{2 \times 28 - 12 - 20} \times 10 \end{aligned}$$

$$= 40 + 160/24$$

$$= 40 + 6.67$$

$$= 46.67$$

(ii)

<b>Class interval</b>	<b>10 – 15</b>	<b>15 – 20</b>	<b>20 – 25</b>	<b>25 – 30</b>	<b>30 – 35</b>	<b>35 – 40</b>
<b>Frequency</b>	<b>30</b>	<b>45</b>	<b>75</b>	<b>35</b>	<b>25</b>	<b>15</b>

**Solution:**

Class interval	10 – 15	15 – 20	20 – 25	25 – 30	30 – 35	35 – 40
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Frequency	30	45	75	35	25	15
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It's seen that the maximum frequency is 75.

So, the corresponding class, i.e. 20 – 25, is the modal class.

And,

$$l = 20, h = 25 - 20 = 5, f = 75, f_1 = 45, f_2 = 35$$

Using the formula for finding mode, we get

$$\begin{aligned} \text{Mode} &= l + \frac{f - f_1}{2f - f_1 - f_2} \times h \\ &= 20 + \frac{75 - 45}{2 \times 75 - 45 - 35} \times 5 \end{aligned}$$

$$= 20 + 150/70$$

$$= 20 + 2.14$$

$$= 22.14$$

(iii)

Class interval	25 – 30	30 – 35	35 – 40	40 – 45	45 – 50	50 – 55
Frequency	25	34	50	42	38	14

**Solution:**

Class interval	25 – 30	30 – 35	35 – 40	40 – 45	45 – 50	50 – 55
Frequency	25	34	50	42	38	14

It's seen that the maximum frequency is 50.

So, the corresponding class, i.e., 35 – 40, is the modal class.

And,

$$l = 35, h = 40 - 35 = 5, f = 50, f_1 = 34, f_2 = 42$$

Using the formula for finding mode, we get

$$\begin{aligned}\text{Mode} &= l + \frac{f - f_1}{2f - f_1 - f_2} \times h \\ &= 35 + \frac{50 - 34}{2 \times 50 - 34 - 42} \times 5\end{aligned}$$

$$= 35 + 80/24$$

$$= 35 + 3.33$$

$$= 38.33$$

**4. Compare the modal ages of two groups of students appearing for an entrance test:**

Age in years	16 – 18	18 – 20	20 – 22	22 – 24	24 – 26
Group A	50	78	46	28	23
Group B	54	89	40	25	17

**Solution:**

Age in years	16 – 18	18 – 20	20 – 22	22 – 24	24 – 26
Group A	50	78	46	28	23
Group B	54	89	40	25	17

For Group A:

It's seen that the maximum frequency is 78.

So, the corresponding class 18 – 20 is the model class.

And,

$$l = 18, h = 20 - 18 = 2, f = 78, f_1 = 50, f_2 = 46$$

Using the formula for finding mode, we get

$$\text{Mode} = l + \frac{f - f_1}{2f - f_1 - f_2} \times h$$

$$= 18 + \frac{78 - 50}{2 \times 78 - 50 - 46} \times 2$$

$$= 18 + 56/60$$

$$= 18 + 0.93$$

$$= 18.93 \text{ years}$$

For group B:

It's seen that the maximum frequency is 89

So, the corresponding class 18 – 20 is the modal class.

And,

$$l = 18, h = 20 - 18 = 2, f = 89, f_1 = 54, f_2 = 40$$

Using the formula for finding mode, we get

$$= l + \frac{f - f_1}{2f - f_1 - f_2} \times h$$

$$= 18 + \frac{89 - 54}{2 \times 89 - 54 - 40} \times 2$$

Mode

$$= 18 + 70/84$$

$$= 18 + 0.83$$

$$= 18.83 \text{ years}$$

Therefore, the modal age of Group A is higher than that of Group B.

**5. The marks in science of 80 students of class X are given below. Find the mode of the marks obtained by the students in science.**

<b>Marks</b>	<b>0 – 10</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>80 – 90</b>	<b>90 – 100</b>
<b>Frequency</b>	<b>3</b>	<b>5</b>	<b>16</b>	<b>12</b>	<b>13</b>	<b>20</b>	<b>5</b>	<b>4</b>	<b>1</b>	<b>1</b>

**Solution:**

Marks	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80	80 – 90	90 – 100
Frequency	3	5	16	12	13	20	5	4	1	1

It's seen that the maximum frequency is 20.

So, the corresponding class 50 – 60 is the modal class.

And,

$$l = 50, h = 60 - 50 = 10, f = 20, f_1 = 13, f_2 = 5$$

Using the formula for finding mode, we get

$$\begin{aligned} \text{Mode} &= l + \frac{f - f_1}{2f - f_1 - f_2} \times h \\ &= 50 + \frac{20 - 13}{2 \times 20 - 13 - 5} \times 10 \end{aligned}$$

$$= 50 + 70/22$$

$$= 50 + 3.18$$

$$= 53.18$$

**6. The following is the distribution of height of students of a certain class in a 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 average height of maximum number of students.**

**Solution:**

Heights(exclusive )	160 – 162	163 – 165	166 – 168	169 – 171	172 – 174
Heights (inclusive)	159.5 – 162.5	162.5 – 165.5	165.5 – 168.5	168.5 – 171.5	171.5 – 174.5
No of students	15	118	142	127	18

It's seen that the maximum frequency is 142.

So, the corresponding class 165.5 – 168.5 is the modal class.

And,

$$l = 165.5, h = 168.5 - 165.5 = 3, f = 142, f_1 = 118, f_2 = 127$$

Using the formula for finding mode, we get

$$\begin{aligned} \text{Mode} &= l + \frac{f - f_1}{2f - f_1 - f_2} \times h \\ &= 165.5 + \frac{142 - 118}{2 \times 142 - 118 - 127} \times 3 \\ &= 165.5 + 72/39 \\ &= 165.5 + 1.85 \\ &= 167.35 \text{ cm} \end{aligned}$$

**7. The following table shows the ages of the patients admitted in a hospital during a year:**

<b>Ages (in years):</b>	<b>5 – 15</b>	<b>15 – 25</b>	<b>25 – 35</b>	<b>35 – 45</b>	<b>45 – 55</b>	<b>55 – 65</b>
<b>No of students:</b>	<b>6</b>	<b>11</b>	<b>21</b>	<b>23</b>	<b>14</b>	<b>5</b>

**Find the mode and the mean of the data given above. Compare and interpret the two measures of central tendency.**

**Solution:**



To find the mean:

For the given data, let the assumed mean (A) = 30

Age (in years)	Number of patients $f_i$	Class marks $x_i$	$d_i = x_i - 275$	$f_i d_i$
5 – 15	6	10	– 20	-120
15 – 25	11	20	– 10	-110
25 – 35	21	30	0	0
35 – 45	23	40	10	230
45 – 55	14	50	20	280
55 – 65	5	60	30	150
	$N = 80$			$\Sigma f_i d_i = 430$

It's observed from the table that  $\Sigma f_i = N = 80$  and  $\Sigma f_i d_i = 430$ .

Using the formula for mean,

$$\text{Mean } (\bar{x}) = A + \frac{\Sigma f_i d_i}{\Sigma f_i}$$

$$= 30 + 430/80$$

$$= 30 + 5.375$$

$$= 35.375$$

$$= 35.38$$

Thus, the mean of this data is 35.38. It can also be interpreted that, on average, the age of patients admitted to the hospital was 35.38 years.

It is also observed that the maximum class frequency is 23, and it belongs to the class interval 35 – 45

So, the modal class is 35 – 45 with the Lower limit (l) of modal class = 35

And, Frequency (f) of modal class = 23

Class size (h) = 10

Frequency ( $f_1$ ) of class preceding the modal class = 21

Frequency ( $f_2$ ) of class succeeding the modal class = 14

$$\begin{aligned} &= l + \frac{f - f_1}{2f - f_1 - f_2} \times h \\ &= 35 + \frac{23 - 21}{2 \times 23 - 21 - 14} \times 10 \\ &= 35 + \frac{2}{46 - 35} \times 10 \\ &= 35 + 1.81 = 36.8 \end{aligned}$$

Mode

Therefore, the mode is 36.8. This represents that the maximum number of patients admitted to the hospital was of 36.8 years.

Hence, it's seen that mode is greater than the mean.

**8. The following data gives the information on the observed lifetimes (in hours) of 225 electrical components:**

<b>Lifetimes (in hours):</b>	<b>0 – 20</b>	<b>20 – 40</b>	<b>40 – 60</b>	<b>60 – 80</b>	<b>80 – 100</b>	<b>100 – 120</b>
<b>No. of components:</b>	<b>10</b>	<b>35</b>	<b>52</b>	<b>61</b>	<b>38</b>	<b>29</b>

**Determine the modal lifetimes of the components.**

**Solution:**

From the data given above it is observed that the maximum class frequency is 61, which belongs to the class interval 60 – 80.

So, modal class limit ( $l$ ) of modal class = 60

Frequency ( $f$ ) of modal class = 61

Frequency ( $f_1$ ) of class preceding the modal class = 52

Frequency ( $f_2$ ) of class succeeding the modal class = 38

Class size (h) = 20

Using the formula for find mode, we have

$$\begin{aligned} &= l + \frac{f - f_1}{2f - f_1 - f_2} \times h \\ &= 60 + \frac{61 - 52}{2 \times 61 - 52 - 38} \times 20 \\ &= 60 + \frac{9}{122 - 90} \times 20 \\ &= 60 + \frac{9 \times 20}{32} \\ &= 60 + \frac{90}{16} \\ &= 60 + 5.625 = 65.625 \end{aligned}$$

Mode

Thus, the modal lifetime of electrical components is 65.625 hours

**9. The following table gives the daily income of 50 workers of a factory:**

<b>Daily income</b>	<b>100 – 120</b>	<b>120 – 140</b>	<b>140 – 160</b>	<b>160 – 180</b>	<b>180 – 200</b>
<b>Number of workers</b>	<b>12</b>	<b>14</b>	<b>8</b>	<b>6</b>	<b>10</b>

**Find the mean, mode and median of the above data.**

**Solution:**

Class interval	Mid value (x)	Frequency (f)	fx	Cumulative frequency
100 – 120	110	12	1320	12
120 – 140	130	14	1820	26
140 – 160	150	8	1200	34

160 – 180	170	6	1000	40
180 – 200	190	10	1900	50
		N = 50	$\Sigma fx = 7260$	

We know that,

$$\text{Mean} = \Sigma fx / N$$

$$= 7260 / 50$$

$$= 145.2$$

Then,

We have, N = 50

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

So, the cumulative frequency just greater than N/2 is 26, then the median class is 120 – 140

Such that l = 120, h = 140 – 120 = 20, f = 14, F = 12

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

$$= 120 + \frac{25 - 12}{14} \times 20$$

$$= 120 + 260/14$$

$$= 120 + 18.57$$

$$= 138.57$$

From the data, its observed that maximum frequency is 14, so the corresponding class 120 – 140 is the modal class

And,

$$l = 120, h = 140 - 120 = 20, f = 14, f_1 = 12, f_2 = 8$$

$$\begin{aligned}
 \text{Mode} &= l + \frac{f - f_1}{2f - f_1 - f_2} \times h \\
 &= 120 + \frac{14 - 12}{2 \times 14 - 12 - 8 \times 20} \\
 &= 120 + \frac{40}{8} \\
 &= 120 + 5 \\
 &= 125
 \end{aligned}$$

Therefore, mean = 145.2, median = 138.57 and mode = 125

## Benefits of Solving RD Sharma Solutions Class 10 Maths Chapter 7 Exercise 7.5

Solving RD Sharma Solutions for Class 10 Maths Chapter 7, Exercise 7.5 on Statistics offers several benefits:

**Conceptual Clarity:** The exercise provides a step-by-step approach to understanding statistics, specifically concepts like mean, median, and mode. Solving these problems helps build a strong foundation in these essential concepts.

**Improved Problem-Solving Skills:** RD Sharma's solutions encourage systematic problem-solving strategies, making it easier to approach similar questions in exams.

**Exam Preparation:** Statistics is a crucial topic in Class 10 exams. Practicing from RD Sharma solutions helps familiarize students with typical question formats and difficulty levels, boosting confidence during exams.

**Error Reduction:** By solving RD Sharma solutions, students can learn from mistakes and improve their accuracy in calculations and formula applications, especially in areas like frequency distribution tables.

**Time Management:** Regular practice helps students develop speed and efficiency, which is essential for managing time effectively during exams.

**Builds a Strong Mathematical Foundation:** The solutions cater to a range of difficulty levels, from basics to advanced, preparing students for higher studies in mathematics.

**Clarifies Doubts:** Since RD Sharma's solutions provide detailed explanations, they help clear up any confusion or doubts students might have in topics like cumulative frequency and central tendency measures.