NCERT Solutions for Class 10 Maths Chapter 13 Exercise 13.3: NCERT Solutions for Class 10 Maths Chapter 13 Exercise 13.3 focuses on further understanding the concepts of statistics through the interpretation of grouped data, cumulative frequency, and the graphical representation of data.

In this exercise, students practice finding the mean, median, and mode from frequency distributions and understand their practical applications. The solutions provide clear steps for calculating the measures of central tendency, ensuring that students grasp both the formula-based and graphical methods of solving problems. By solving this exercise, students can enhance their ability to analyze data sets and interpret statistical information accurately, which is essential for academic exams.

NCERT Solutions for Class 10 Maths Chapter 13 Exercise 13.3 Overview

NCERT Solutions for Class 10 Maths Chapter 13 Exercise 13.3 focuses on calculating the mean, median, and mode for grouped data, helping students deepen their understanding of statistical analysis. The exercise guides students through the process of finding the measures of central tendency for both discrete and continuous frequency distributions.

Through this exercise, students gain proficiency in working with grouped data, learning how to interpret and analyze data effectively.

Class 10 Maths Chapter 13 Exercise 13.3 Questions and Answers PDF

The Class 10 Maths Chapter 13 Exercise 13.3 Questions and Answers PDF provides a detailed and structured approach to solving problems related to the mean, median, and mode for grouped data. It includes step-by-step solutions for all the questions, ensuring that students understand how to apply the appropriate formulas for each statistical measure.

By solving the solutions in the PDF, students can easily grasp the concepts and practice calculating these measures from frequency distributions. The PDF are a valuable resource for exam preparation and for mastering the techniques required for data analysis. You can access the PDF through the link provided below for a comprehensive learning experience.

Class 10 Maths Chapter 13 Exercise 13.3 Questions and Answers PDF

NCERT Class 10 Maths Chapter 13 Statistics Exercise 13.3

Below is the NCERT Class 10 Maths Chapter 13 Statistics Exercise 13.3:

Solve the followings Questions.

1. The following frequency distribution gives the monthly consumption of electricity of 68 consumers of a locality. Find the median, mean and mode of the data and compare them.

Monthly consumption (in units)	65 – 85	85 – 105	105 – 125	125 – 145	145 – 165	165 – 185	185 – 205
No. of consumers	4	5	13	20	14	8	4

Answer:

Monthly consumption (in units)	Number of consumers (f_i)	Cumulative frequency (cf)	Class mark (x_i)	$u_i = \dfrac{x_i - a}{h}$	$f_i u_i$
65 – 85	4	4	75	–3	–12
85 – 105	5	9	95	–2	–10
105 – 125	13	22	115	–1	–13
125 – 145	20	42	135 = a (Let)	0	0
145 – 165	14	56	155	1	14
165 – 185	8	64	175	2	16
185 – 205	4	68	195	3	12
Total	$\Sigma f_i = 68$				$\Sigma f_i u_i = 7$

We have,

$$\text{Mean} = a + \frac{\Sigma f_i u_i}{\Sigma f_i} \times h = 135 + \frac{7}{68} \times 20 = 135 + \frac{35}{17}$$

$$= 135 + 2.06 = 137.06 \text{ units}$$

Here,

$$n = 68, \ \frac{n}{2} = \frac{68}{2} = 34,$$

∴ Median class = 125 – 145

Here, $l = 125, n = 68, f = 20, cf = 22, h = 20$

$$\text{Median} = l + \left(\frac{\frac{n}{2} - cf}{f} \right) \times h = 125 + \left(\frac{34 - 22}{20} \right) \times 20$$

$$= 125 + 12 = 137 \text{ units}$$

Maximum frequency = 20

Modal class = 125 − 145 Here, $l = 125, f_0 = 13, f_1 = 20, f_2 = 14$

∴   Mode $= l + \left(\dfrac{f_1 - f_0}{2f_1 - f_0 - f_2}\right) \times h = 125 + \left(\dfrac{20 - 13}{40 - 13 - 14}\right) \times 20$

$= 125 + \dfrac{7 \times 20}{13} = 125 + \dfrac{140}{13} = 125 + 10.76 = 135.76$ units

Mean > Median > Mode

2. If the median of the distribution given below is 28.5, then find the values of x and y.

Class-interval	Frequency
0 − 10	5
10 − 20	x
20 − 30	20
30 − 40	15
40 − 50	y
50 − 60	5
Total	60

Answer:

Class interval	Frequency	Cumulative frequency
0 – 10	5	5
10 – 20	x	5 + x(c)
20 – 30	20(f)	25 + x
30 – 40	15	40 + x
40 – 50	y	40 + x + y
50 – 60	5	45 + x + y
Total	n = 60	

We have $45 + x + y = 60$ ...(i)   [Given]

$\because n = 60$ $\therefore \dfrac{n}{2} = \dfrac{60}{2} = 30$

Since the median lies in the class interval (20 – 30), so the median class is (20 – 30).

Hence, $l = 20, f = 20, cf = 5 + x$ and $h = 10$.

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

$\Rightarrow$ $28.5 = 20 + \left(\dfrac{30 - 5 - x}{20}\right) \times 10$

$\Rightarrow$ $28.5 = 20 + \left(\dfrac{25 - x}{2}\right)$

$\Rightarrow$ $57 = 40 + 25 - x \Rightarrow 25 - x = 57 - 40$

$\Rightarrow 25 - x = 17$ $\Rightarrow x = 25 - 17 = 8.$

Putting $x = 8$ in equation (i), we get:

$\Rightarrow$ $45 + 8 + y = 60$ $\Rightarrow y = 60 - 53 = 7.$

3. A life insurance agent found the following data for distribution of ages of 100 policy holders. Calculate the median age, if policies are only given to persons having age 18 years onwards but less than 60 years.

Age (in years)	Number of policy holders
Below 20	2
Below 25	6
Below 30	24
Below 35	45
Below 40	78
Below 45	89
Below 50	92
Below 55	98
Below 60	100

Answer:

Age (in years)	Number of policy holders	Cumulative frequency
0 – 20	2	2
20 – 25	6 – 2 = 4	6
25 – 30	24 – 6 = 18	24
30 – 35	45 – 24 = 21	45
35 – 40	78 – 45 = 33	78
40 – 45	89 – 78 = 11	89
45 – 50	92 – 89 = 3	92
50 – 55	98 – 92 = 6	98
55 – 60	100 – 98 = 2	100
Total	100	

Here, $\dfrac{n}{2} = \dfrac{100}{2} = 50$

$\therefore$ Median class $= 35 - 40$, So, $l = 35$, $cf = 45$, $h = 5$, $f = 33$

We have, Median $= l + \left(\dfrac{\frac{n}{2} - cf}{f}\right) \times h = 35 + \left(\dfrac{50 - 45}{33}\right) \times 5 = 35 + \dfrac{25}{33}$

$= 35 + 0.76 = 35.76$ years

4. The lengths of 40 leaves of a plant are measured correct to the nearest millimeter and data obtained is represented in the following table. Find the median length of the leaves.

Length (in mm)	Number of leaves
118 – 126	3
127 – 135	5
136 – 144	9
145 – 153	12
154 – 162	5
163 – 171	4
172 – 180	2

Answer:

Class interval	Frequency	Cumulative frequency
117.5 – 126.5	3	3
126.5 – 135.5	5	8
135.5 – 144.5	9	17 (c)
144.5 – 153.5	12 (f)	29
153.5 – 162.5	5	34
162.5 – 171.5	4	38
171.5 – 180.5	2	40
	$n = 40$	

$\because n = 40 \quad \therefore \dfrac{n}{2} = \dfrac{40}{2} = 20.$

Since 12 is the maximum frequency, so the median class is (144.5 – 153.5).

Here, $l = 144.5, f = 12, cf = 17$ and $h = 9$

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

$$= 144.5 + \left(\dfrac{20 - 17}{12}\right) \times 9$$

$$= 144.5 + \dfrac{9}{4}$$

$$= 144.5 + 2.25 = 146.75 \text{ mm}.$$

Hence, the median length of leaves is **146.75 mm**.

Benefits of Solving NCERT Solutions for Class 10 Maths Chapter 13 Exercise 13.3

- **Strengthens Understanding of Central Tendency**: Solving this exercise helps students gain a solid understanding of how to calculate the mean, median, and mode for grouped data, which are fundamental concepts in statistics.
- **Improves Problem-Solving Skills**: By practicing the problems in this exercise, students become more adept at applying the relevant formulas and techniques, allowing them to approach similar problems with ease and accuracy.
- **Prepares for Exams**: This exercise covers essential topics that are frequently tested in board exams. Regular practice improves speed and accuracy, making students better prepared for exam questions related to data handling and analysis.
- **Clarifies Conceptual Understanding**: The step-by-step approach in the solutions helps students clarify any doubts about calculating mean, median, and mode, enhancing their conceptual understanding of the topic.