NCERT Solutions Class 11 Maths
Chapter 13: Statistics
EXERCISE 13.1

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Quick Summary: In NCERT Solutions Class 11 Maths Chapter 13 Exercise 13.1, students learn to calculate measures of dispersion including mean deviation about mean and median for various data sets. This exercise covers fundamental concepts of statistical variation analysis with step-by-step solutions that are essential for CBSE Class 11 board exams and competitive entrance tests.

Key Takeaways:

- Mean deviation about mean formula: M.D.(\barx) = \sum |x_i - \barx|n for individual series
- Mean deviation about median formula: M.D.(M) = (\sum |x_i - M|)/(n) where M is the median
- Understanding when to use mean vs median as the central tendency measure for different data distributions
- Step-by-step calculation methods for both ungrouped and grouped frequency data problems

Complete Solutions

Question 1

QUESTION

Find the mean deviation about the mean for the data:

4, 7, 8, 9, 10, 12, 13, 17

SOLUTION

We need to find the mean deviation about the mean for the given data set: 4, 7, 8, 9, 10, 12, 13, 17.

Step 1: Calculate the mean of the data.

The mean, denoted by , is the sum of all observations divided by the number of observations.

So, the mean of the data is 10.

Step 2: Calculate the absolute deviations from the mean.

We need to find the absolute difference between each data point and the mean, i.e., for each .

Step 3: Calculate the mean deviation about the mean.

The mean deviation about the mean is the average of the absolute deviations.

Therefore, the mean deviation about the mean for the given data is 3.

ANSWER

3

Question 2

QUESTION

Find the mean deviation about the mean for the data:

38, 70, 48, 40, 42, 55, 63, 46, 54, 44

SOLUTION

We need to find the mean deviation about the mean for the given data set.

Step 1: Calculate the mean of the data.

The mean, denoted by , is the sum of all observations divided by the number of observations.

The given data is: 38, 70, 48, 40, 42, 55, 63, 46, 54, 44

Sum of the observations = 38 + 70 + 48 + 40 + 42 + 55 + 63 + 46 + 54 + 44 = 500

Number of observations = 10

Therefore, the mean is:

Step 2: Calculate the absolute deviations from the mean.

We need to find for each observation .

Step 3: Calculate the sum of the absolute deviations.

Sum of absolute deviations = 12 + 20 + 2 + 10 + 8 + 5 + 13 + 4 + 4 + 6 = 84

Step 4: Calculate the mean deviation about the mean.

Mean Deviation =

Mean Deviation =

Therefore, the mean deviation about the mean for the given data is 8.4.

ANSWER

8.4

Question 3

QUESTION

Find the mean deviation about the median for the data:

13, 17, 16, 14, 11, 13, 10, 16, 11, 18, 12, 17

SOLUTION

We are asked to find the mean deviation about the median for the given data set.

Step 1: Arrange the data in ascending order

First, we arrange the given data in ascending order:

10, 11, 11, 12, 13, 13, 14, 16, 16, 17, 17, 18

Step 2: Find the median

Since there are 12 data points (an even number), the median is the average of the 6th and 7th values.

Median

Step 3: Calculate the absolute deviations from the median

We need to find the absolute difference between each data point and the median (13.5):

Step 4: Calculate the sum of the absolute deviations

Sum of deviations

Step 5: Calculate the mean deviation

Mean deviation

Final Answer: The mean deviation about the median is 2.33.

ANSWER

2.33

Question 4

QUESTION

Find the mean deviation about the median for the data:

36, 72, 46, 42, 60, 45, 53, 46, 51, 49

SOLUTION

We are asked to find the mean deviation about the median for the given data set.

Step 1: Arrange the data in ascending order

First, we arrange the given data in ascending order:

36, 42, 45, 46, 46, 49, 51, 53, 60, 72

Step 2: Find the median

Since there are 10 data points (an even number), the median is the average of the 5th and 6th values.

Median

Step 3: Calculate the absolute deviations from the median

We need to find the absolute difference between each data point and the median (47.5):

Step 4: Calculate the sum of the absolute deviations

Sum of deviations

Step 5: Calculate the mean deviation

Mean deviation about the median

Mean deviation

Final Answer: The mean deviation about the median is 7.

ANSWER

7

Question 5

QUESTION

Find the mean deviation about the mean for the following data:

x_i: 5, 10, 15, 20, 25

f_i: 7, 4, 6, 3, 5

SOLUTION

We need to find the mean deviation about the mean for the given data. This involves calculating the mean, then finding the absolute deviations from the mean, and finally averaging those deviations.

Step 1: Calculate the mean ()

First, we need to find the sum of the products of and , which is . Then, we divide by the sum of the frequencies, .

Therefore, the mean is:

Step 2: Calculate the absolute deviations from the mean ()

We need to find the absolute difference between each and the mean ().

Step 3: Calculate the weighted absolute deviations ()

Now, multiply each absolute deviation by its corresponding frequency.

Step 4: Calculate the sum of the weighted absolute deviations ()

Step 5: Calculate the mean deviation about the mean

Divide the sum of the weighted absolute deviations by the sum of the frequencies.

The mean deviation about the mean is 6.32.

ANSWER

6.32

Question 6

QUESTION

Find the mean deviation about the mean for the following data:

x_i: 10, 30, 50, 70, 90

f_i: 4, 24, 28, 16, 8

SOLUTION

We are asked to find the mean deviation about the mean for the given data. This involves calculating the mean, then finding the absolute deviations from the mean, and finally averaging these deviations.

Step 1: Calculate the mean ()

First, we need to find the mean of the data. The formula for the mean of grouped data is:

Calculate :

Calculate :

Now, calculate the mean:

Step 2: Calculate the absolute deviations from the mean ()

We need to find the absolute difference between each and the mean :

Step 3: Calculate

Multiply each absolute deviation by its corresponding frequency:

Step 4: Calculate the sum of

Step 5: Calculate the mean deviation about the mean

The formula for mean deviation about the mean is:

The mean deviation about the mean is 16.

ANSWER

16

Question 7

QUESTION

Find the mean deviation about the median for the following data:

x_i: 5, 7, 9, 10, 12, 15

f_i: 8, 6, 2, 2, 2, 6

SOLUTION

We are asked to find the mean deviation about the median for the given data.

Step 1: Arrange the data in ascending order and create a cumulative frequency table.

The data is already in ascending order. Let's create the cumulative frequency table:

		Cumulative Frequency (cf)
5	8	8
7	6	14
9	2	16
10	2	18
12	2	20
15	6	26

Step 2: Determine the median.

The total frequency . Since is even, the median is the average of the th and th observations.

. The 13th observation is 7, and the 14th observation is also 7 (from the cumulative frequency table).

Therefore, the median .

Step 3: Calculate the absolute deviations from the median, .

5	8		
7	6		
9	2		
10	2		

12	2		
15	6		

Step 4: Calculate the sum of the weighted absolute deviations, .

Step 5: Calculate the mean deviation about the median.

Mean Deviation

Final Answer: The mean deviation about the median is 3.23.

ANSWER

3.23

Question 8

QUESTION

Find the mean deviation about the median for the following data:

x_i: 15, 21, 27, 30, 35

f_i: 3, 5, 6, 7, 8

SOLUTION

We are asked to find the mean deviation about the median for the given data.

Step 1: Arrange the data in ascending order (if it's not already) and create a cumulative frequency table.

The data is already in ascending order. Let's create the cumulative frequency table:

Step 2: Find the median.

The total frequency . The median is the value corresponding to the observation.

. The 15th observation lies in the cumulative frequency 14 to 21, so the median is 30.

Step 3: Calculate the absolute deviations from the median, .

Step 4: Calculate .

Step 5: Calculate .

Step 6: Calculate the mean deviation about the median.

Mean Deviation =

Final Answer: The mean deviation about the median is approximately 5.1.

ANSWER

5.1

Question 9

QUESTION

Find the mean deviation about the mean for the grouped data:

Income per day (₹): 0–100, 100–200, 200–300, 300–400, 400–500, 500–600, 600–700, 700–800

No. of persons: 4, 8, 9, 10, 7, 5, 4, 3

SOLUTION

We are asked to find the mean deviation about the mean for the given grouped data.

Step 1: Calculate the midpoints () of each class interval.

The midpoints are calculated as the average of the upper and lower limits of each class.

0-100:

100-200:

200-300:

300-400:

400-500:

500-600:

600-700:

700-800:

Step 2: Calculate for each class.

Multiply the frequency () by the midpoint () for each class.

Step 3: Calculate the mean ().

Step 4: Calculate for each class.

Step 5: Calculate for each class.

Step 6: Calculate the mean deviation about the mean.

The mean deviation about the mean is 157.92.

ANSWER

157.92

Question 10

QUESTION

Find the mean deviation about the mean for the grouped data:

Height (cm): 95–105, 105–115, 115–125, 125–135, 135–145, 145–155

No. of boys: 9, 13, 26, 30, 12, 10

SOLUTION

We are asked to find the mean deviation about the mean for the given grouped data.

Step 1: Find the midpoints of each class interval ()

The midpoints are calculated as the average of the upper and lower limits of each class interval.

95-105:

105-115:

115-125:

125-135:

135-145:

145-155:

Step 2: Calculate for each class

Multiply the frequency () by the midpoint () for each class.

Step 3: Calculate the mean ()

The mean is given by

Step 4: Calculate for each class

Step 5: Calculate for each class

Step 6: Calculate the mean deviation about the mean

Mean Deviation =

Mean Deviation =

Final Answer: The mean deviation about the mean is 11.28 (rounded to two decimal places).

ANSWER

11.28

Question 11

QUESTION

Find the mean deviation about the median for the following data:

Marks: 0–10, 10–20, 20–30, 30–40, 40–50, 50–60

No. of girls: 6, 8, 14, 16, 4, 2

SOLUTION

We need to find the mean deviation about the median for the given data. This involves calculating the median first, then finding the absolute deviations from the median, and finally computing the mean of these deviations.

Step 1: Prepare the cumulative frequency table

We need to find the cumulative frequencies to determine the median class.

Marks	No. of girls (f)	Cumulative Frequency (cf)
0-10	6	6
10-20	8	14
20-30	14	28
30-40	16	44
40-50	4	48
50-60	2	50

Step 2: Determine the median class

Total frequency, . The cumulative frequency just greater than 25 is 28, so the median class is 20-30.

Step 3: Calculate the median

The median is given by the formula: where is the lower limit of the median class, is the total frequency, is the cumulative frequency of the class preceding the median class, is the frequency of the median class, and is the class width.

Here, , , , , and .

Step 4: Calculate the mean deviation about the median

First, find the midpoints of each class interval: 5, 15, 25, 35, 45, 55.

Next, calculate the absolute deviations :

, , , , ,

Now, calculate :

, , , , ,

Sum of

Mean deviation about the median

Final Answer: The mean deviation about the median is 10.34.

ANSWER

10.34

Question 12

QUESTION

Calculate the mean deviation about median age for the age distribution of 100 persons:

Age (years): 16–20, 21–25, 26–30, 31–35, 36–40, 41–45, 46–50, 51–55

No. of persons: 5, 6, 12, 14, 26, 12, 16, 9

SOLUTION

We need to calculate the mean deviation about the median for the given age distribution of 100 persons. This involves finding the median first, then calculating the absolute deviations from the median, and finally finding the mean of these deviations.

Step 1: Construct the cumulative frequency table

We need to find the cumulative frequencies to determine the median class.

Age (years)	No. of persons (f)	Cumulative frequency (cf)
16–20	5	5
21–25	6	11
26–30	12	23
31–35	14	37
36–40	26	63
41–45	12	75
46–50	16	91
51–55	9	100

Step 2: Determine the median class

The total number of persons is . The median is the value that divides the data into two equal halves, so we look for the class containing the th observation. From the cumulative frequency table, the cumulative frequency just greater than 50 is 63, which corresponds to the class 36–40. Therefore, the median class is 36–40.

Step 3: Calculate the median

The median is given by the formula: , where is the lower limit of the median class, is the total frequency, is the cumulative frequency of the class preceding the median class, is the frequency of the median class, and is the class width.

Here, , , , , and .

Step 4: Calculate the mean deviation about the median

First, find the midpoints of each class interval and then calculate for each class.

Then, calculate for each class.

Finally, calculate the mean deviation:

Age (years)				
16–20	18	5	20	100
21–25	23	6	15	90
26–30	28	12	10	120
31–35	33	14	5	70
36–40	38	26	0	0
41–45	43	12	5	60
46–50	48	16	10	160
51–55	53	9	15	135
		N=100		

Final Answer: The mean deviation about the median age is 7.35.

ANSWER

7.35

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Key Formulas

Important Formulas for Exercise 13.1

Formula / Concept	Description
Mean of Ungrouped Data (\barx)	For a set of n observations x_1, x_2, ..., x_n, the mean is calculated as: \barx = \sum_i=1^n x_in
Mean of Grouped Data (\barx)	For a discrete frequency distribution with observations x_i and corresponding frequencies f_i: \barx = \sum_i=1^n f_i x_i\sum_i=1^n f_i = (\sum f_i x_i)/(N) where N = \sum_i=1^n f_i.
Median of Ungrouped Data (M)	After arranging the data in ascending order: • If the number of observations (n) is odd, the median is the \left((n+1)/(2)\right)^th observation. • If the number of observations (n) is even, the median is the average of the \left((n)/(2)\right)^th and \left((n)/(2) + 1\right)^th observations.
Mean Deviation about the Mean for Ungrouped Data MD(\barx)	The mean of the absolute deviations from the mean. MD(\barx) = \sum_i=1^n |x_i - \barx|n
Mean Deviation about the Median for Ungrouped Data MD(M)	The mean of the absolute deviations from the median. MD(M) = \sum_i=1^n |x_i - M|n
Mean Deviation about the Mean for Grouped Data MD(\barx)	For a discrete frequency distribution: MD(\barx) = \sum_i=1^n f_i |x_i - \barx|\sum_i=1^n f_i = \sum f_i |x_i - \barx|N
Mean Deviation about the Median for Grouped Data MD(M)	For a discrete frequency distribution: MD(M) = \sum_i=1^n f_i |x_i - M| \sum_i=1^n f_i = (\sum f_i |x_i - M|)/(N)
Variance for Ungrouped Data (\sigma^2)	The average of the squared differences from the Mean. \sigma^2 = \sum_i=1^n (x_i - \barx)^2n
Variance for Grouped Data (\sigma^2)	For a discrete frequency distribution: \sigma^2 = \sum_i=1^n f_i (x_i - \barx)^2\sum_i=1^n f_i = \sum f_i (x_i - \barx)^2N
Standard Deviation (\sigma)	The square root of the variance. It is expressed in the same units as the data. \sigma = √\textVariance
Standard Deviation for Ungrouped Data (\sigma)	\sigma = √\sum_i=1^n (x_i - \barx)^2n

Formula / Concept	Description
Standard Deviation for Grouped Data (\sigma)	\sigma = √\sum_i=1^n f_i (x_i - \barx)^2N

Top FAQs

Q1. How many questions are included in NCERT Solutions for Class 11 Maths Chapter 13 Statistics Exercise 13.1 for CBSE board exam 2025-26?

NCERT Solutions for Class 11 Maths Chapter 13 Statistics Exercise 13.1 contains exactly 12 questions covering measures of dispersion. These questions include problems on range, mean deviation, variance, and standard deviation formulas essential for CBSE board exam 2025-26 preparation.

Q2. Where can I download free PDF of NCERT Solutions for Class 11 Maths Chapter 13 Statistics Exercise 13.1 with step by step solutions?

You can download free PDF of NCERT Solutions for Class 11 Maths Chapter 13 Statistics Exercise 13.1 from the official NCERT website and various educational platforms offering step by step solutions. These PDFs are updated according to the latest CBSE syllabus 2025-26 and provide detailed explanations for all 12 questions on measures of dispersion.

Q3. How many marks does Chapter 13 Statistics carry in CBSE Class 11 Maths board exam 2025-26 syllabus?

Chapter 13 Statistics carries 6 marks weightage in CBSE Class 11 Maths board exam 2025-26 as part of Unit V - Statistics and Probability. Exercise 13.1 focuses on measures of dispersion including mean deviation, variance, and standard deviation which are crucial topics for scoring full marks in this unit.

Q4. Which is the most difficult question in NCERT Solutions Class 11 Maths Chapter 13 Statistics Exercise 13.1 for CBSE 2025-26?

Questions 11 and 12 in NCERT Solutions Class 11 Maths Chapter 13 Statistics Exercise 13.1 are considered the most difficult as they involve complex calculations of variance and standard deviation for grouped data. These questions require thorough understanding of mean deviation formula and step by step problem-solving approach for CBSE board exam 2025-26.

Q5. What is the Mean Deviation Formula explained in NCERT Solutions for Class 11 Maths Chapter 13 Statistics Exercise 13.1?

The Mean Deviation Formula in NCERT Solutions for Class 11 Maths Chapter 13 Statistics Exercise 13.1 is M.D. = Σ|xi - x̄|/n for ungrouped data and M.D. = Σfi|xi - x̄|/Σfi for grouped data, where x̄ is the mean. This formula measures the average absolute deviation from the central value and is fundamental for solving problems in Exercise 13.1 for CBSE 2025-26.

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