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# SOLUTIONS: CHAPTER TEST STATISTICS

Mathematics | Class IX (2026/STATIS/09/002)

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## Section A (Multiple Choice Questions)

1. **Answer:** (c) 140

**Solution:** Class mark =  $\frac{\text{Lower Limit} + \text{Upper Limit}}{2} = \frac{130 + 150}{2} = \frac{280}{2} = 140$ .

2. **Answer:** (c) 7

**Solution:** Let lower limit be  $l$ . Class Mark =  $l + \frac{\text{Width}}{2}$ .

$$10 = l + \frac{6}{2} \implies 10 = l + 3 \implies l = 7.$$

3. **Answer:** (a) 4

**Solution:** Mean =  $\frac{\sum x_i}{n} \implies 9 = \frac{x + (x+3) + (x+5) + (x+7) + (x+10)}{5} \implies 45 = 5x + 25 \implies 5x = 20 \implies x = 4$ .

4. **Answer:** (a) Primary data

**Solution:** Data collected first-hand by the investigator for a specific purpose is primary data.

5. **Answer:** (b) Range

**Solution:** Range = Maximum value – Minimum value.

6. **Answer:** (c) Frequency of the corresponding class interval

**Solution:** In a histogram with uniform class widths, the area (and height) is proportional to the frequency.

7. **Answer:** (b) 5.6

**Solution:** First five prime numbers: 2, 3, 5, 7, 11. Mean =  $\frac{2+3+5+7+11}{5} = \frac{28}{5} = 5.6$ .

8. **Answer:** (a)  $\frac{\text{Frequency}}{\text{Class size}} \times \text{Minimum class size}$

**Solution:** This formula ensures the area of the rectangle represents the frequency when widths vary.

## Section B (Very Short Answer Questions)

1. **Solution:** Mean =  $\frac{x + (x-1) + (x-2) + (x-3) + (x-4)}{5} = 20$   
 $\frac{5x-10}{5} = 20 \implies x - 2 = 20 \implies x = 22$ .

2. **Solution:** Class Mark of 10 – 20 = 15; Class Mark of 20 – 30 = 25; Class Mark of 30 – 40 = 35.

3. **Solution:**

**Frequency:** The number of times a particular observation occurs in a class interval.

**Class Size:** The difference between the upper class limit and the lower class limit of a class.

4. **Solution:** Max Marks = 48, Min Marks = 13.

Range = 48 – 13 = 35.

## Section C (Short Answer Questions)

### 1. Solution:

$$\text{Incorrect Total} = 50 \times 80.4 = 4020.$$

$$\text{Correct Total} = \text{Incorrect Total} - \text{Wrong value} + \text{Correct value}$$

$$\text{Correct Total} = 4020 - 69 + 96 = 4047.$$

$$\text{Correct Mean} = \frac{4047}{50} = 80.94.$$

### 2. Bar Graph Representation:

Students should plot Months on X-axis and Units Sold on Y-axis with a scale of 1 cm = 100 units.

### 3. Mean Calculation:

$x_i$	5	10	15	20	25	Total
$f_i$	7	10	15	8	10	$\sum f_i = 50$
$f_i x_i$	35	100	225	160	250	$\sum f_i x_i = 770$

$$\text{Mean } \bar{x} = \frac{\sum f_i x_i}{\sum f_i} = \frac{770}{50} = 15.4.$$

## Section D (Long Answer Questions)

### 1. Assumed Mean Method ( $A = 25$ ):

Class	$f_i$	Class Mark ( $x_i$ )	$d_i = x_i - 25$	$f_i d_i$
0-10	5	5	-20	-100
10-20	12	15	-10	-120
20-30	25	25	0	0
30-40	10	35	10	100
40-50	8	45	20	160
<b>Total</b>	<b>60</b>			<b>40</b>

$$\text{Mean } \bar{x} = A + \frac{\sum f_i d_i}{\sum f_i} = 25 + \frac{40}{60} = 25 + 0.67 = 25.67.$$

### 2. Histogram Construction:

The histogram should show weight classes on the X-axis (using a kink) and Number of Students on the Y-axis. The final bar (55.5 - 60.5) should have a height of 2 units.

## Case Study Solutions

1. **Answer: B) 30 – 45 minutes** (Peak of the frequency polygon).
2. **Answer: C) 52.5** (Midpoint of the class 45 – 60).
3. **Answer: B) The range would decrease** (Excluding high outliers narrows the spread).
4. **Answer: C) 37 minutes** (New Mean = Old Mean + 2).
5. **Answer: C) The frequency of that class** (For uniform class widths).