

# UNIQUE STUDY POINT

## PRACTICE PAPER 01 (2025-26)

### CHAPTER 13: STATISTICS

By Sumeet Sahu

Website: [uniquestudyonline.com](https://www.uniquestudyonline.com)

Unique Study Point, Amitesh Nagar, Indore, MP

Made with ♥ by Sumeet Sahu

**SUBJECT:** Mathematics

**CLASS:** X

**MAX. MARKS:** 40

**DURATION:** 1½ hrs

#### General Instructions:

- All questions are compulsory.
- This question paper contains **20 questions** divided into five Sections A, B, C, D and E.
- Section A** comprises of 10 MCQs of 1 mark each. **Section B** comprises of 4 questions of 2 marks each. **Section C** comprises of 3 questions of 3 marks each. **Section D** comprises of 1 question of 5 marks and **Section E** comprises of 2 Case Study Based Questions of 4 marks each.
- There is no overall choice.
- Use of Calculators is not permitted.

#### SECTION - A

Questions 1 to 10 carry 1 mark each.

- The relationship between mean, median and mode for a moderately skewed distribution is:
  - Mode = 3 Median - 2 Mean
  - Mode = 2 Median - 3 Mean
  - Mean = 3 Median - 2 Mode
  - Median = 3 Mode - 2 Mean
- While computing mean of grouped data, we assume that the frequencies are:
  - evenly distributed over all the classes
  - centred at the class marks of the classes
  - centred at the upper limits of the classes
  - centred at the lower limits of the classes
- For the following distribution:

Marks	0-10	10-20	20-30	30-40	40-50
Frequency	3	8	12	10	7

The sum of lower limits of the median class and modal class is:

- 40
  - 50
  - 30
  - 45
- If the mean of the first n natural numbers is 15, then the value of n is:
    - 15
    - 30
    - 29

(d) 14

5. The median of the data: 3, 4, 5, 6, 7, 3, 4 is:

- (a) 5
- (b) 3
- (c) 4
- (d) 6

6. For a frequency distribution, mean, median and mode are connected by the relation:

- (a) Mode = 3 Mean - 2 Median
- (b) Mode = 2 Median - 3 Mean
- (c) Mode = 3 Median - 2 Mean
- (d) Mode = 3 Median + 2 Mean

7. Consider the data:

Class	10-20	20-30	30-40	40-50	50-60
Frequency	4	6	8	10	6

The difference between the upper limit of the median class and the lower limit of the modal class is:

- (a) 0
- (b) 10
- (c) 20
- (d) 30

8. The class mark of the class 90-120 is:

- (a) 90
- (b) 105
- (c) 115
- (d) 120

9. **Assertion (A):** The mean of first 10 odd natural numbers is 10.

**Reason (R):** The sum of first n odd natural numbers is  $n^2$ .

- (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
- (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
- (c) Assertion (A) is true but reason (R) is false.
- (d) Assertion (A) is false but reason (R) is true.

10. **Assertion (A):** If  $x_i$  represents class marks and  $f_i$  represents corresponding frequencies, then mean =  $(\sum f_i x_i) / (\sum f_i)$ .

**Reason (R):** Class mark is the mid-point of upper and lower class limits.

- (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
- (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
- (c) Assertion (A) is true but reason (R) is false.
- (d) Assertion (A) is false but reason (R) is true.

## SECTION - B

Questions 11 to 14 carry 2 marks each.

11. Find the mean of the following distribution using direct method:

Class Interval	0-10	10-20	20-30	30-40	40-50
Frequency	5	10	15	8	2

12. The following table shows the ages of patients admitted in a hospital during a week:

Age (in years)	5-15	15-25	25-35	35-45	45-55	55-65

<b>No. of patients</b>	6	11	21	23	14	5
------------------------	---	----	----	----	----	---

Find the modal class.

**13.** If the median of the following frequency distribution is 32.5, find the values of  $f_1$  and  $f_2$ , if the total frequency is 40.

<b>Class</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>Frequency</b>	$f_1$	5	9	12	$f_2$	3

**14.** The mean of 25 observations was found to be 78.4. Later it was detected that one observation 96 was wrongly copied as 69. Find the correct mean.

## SECTION - C

**Questions 15 to 17 carry 3 marks each.**

**15.** Find the mode of the following frequency distribution:

<b>Class</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>	8	12	20	15	10	5

**16.** The following distribution gives the daily income of 50 workers of a factory:

<b>Daily Income (in ₹)</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>	12	14	8	6	10

Find the median daily income.

**17.** Using empirical formula, find the mode of a distribution whose mean is 45 and median is 48.

## SECTION - D

**Question 18 carries 5 marks.**

**18.** The following table gives the daily wages of workers in a factory:

<b>Daily Wages (in ₹)</b>	<b>100-150</b>	<b>150-200</b>	<b>200-250</b>	<b>250-300</b>	<b>300-350</b>	<b>350-400</b>
<b>Number of workers</b>	10	18	25	22	15	10

Find the mean daily wages using step deviation method. Also find the mode and median daily wages.

## SECTION - E (Case Study Based Questions)

**Questions 19 to 20 carry 4 marks each.**

### 19. COVID-19 Pandemic Data Analysis

During the COVID-19 pandemic, a health organization collected data about the age distribution of infected patients in a city. The data is presented below:

<b>Age Group (in years)</b>	<b>Number of Patients</b>
0-20	15
20-40	28

40-60	42
60-80	30
80-100	10

Based on the above information, answer the following questions:

- (a) Find the modal class. **(1 mark)**
- (b) Find the mode of the given data. **(2 marks)**
- (c) Which age group had the least number of infected patients? **(1 mark)**

## 20. Sports Survey in a School

A school conducted a survey to find out the time (in hours per week) spent by students on sports activities. The data collected is shown below:

Time (hours per week)	Number of Students
0-5	8
5-10	16
10-15	x
15-20	12
20-25	6

If the mean time spent is 11.5 hours per week and the total number of students is 60, answer the following:

- (a) Find the value of x. **(2 marks)**
- (b) Find the median class. **(1 mark)**
- (c) Find the median time spent by students on sports. **(1 mark)**

---

Made with ♥ by Sumeet Sahu

Visit: [uniquestudyonline.com](https://www.uniquestudyonline.com)

Unique Study Point, Amitesh Nagar, Indore, MP

**📄 DETAILED ANSWER KEY 📄**  
**PRACTICE PAPER 01 - STATISTICS**

**Answer 1: (a) Mode = 3 Median - 2 Mean**

**Explanation:** This is the empirical relationship between mean, median and mode for a moderately skewed distribution.

✓ **Correct Answer: (a)**

**Answer 2: (b) centred at the class marks of the classes**

**Explanation:** While computing mean of grouped data, we assume that all observations in a class are centered at the class mark (mid-point) of that class.

✓ **Correct Answer: (b)**

**Answer 3: (a) 40**

**Step 1:** Calculate cumulative frequency:

$$N = 3 + 8 + 12 + 10 + 7 = 40$$

$$N/2 = 20$$

**Step 2:** Median class (cf just greater than 20):

Cumulative frequencies: 3, 11, 23, 33, 40

Median class = 20-30 (lower limit = 20)

**Step 3:** Modal class (highest frequency = 12):

Modal class = 20-30 (lower limit = 20)

**Step 4:** Sum = 20 + 20 = 40

✓ **Correct Answer: (a) 40**

**Answer 4: (c) 29**

**Step 1:** Mean of first n natural numbers =  $(n+1)/2$

**Step 2:** Given:  $(n+1)/2 = 15$

$$n + 1 = 30$$

$$n = 29$$

✓ **Correct Answer: (c) 29**

**Answer 5: (c) 4**

**Step 1:** Arrange data in ascending order: 3, 3, 4, 4, 5, 6, 7

**Step 2:** Number of observations  $n = 7$  (odd)

Median = Middle term = 4th term = 4

✓ **Correct Answer: (c) 4**

**Answer 6: (c) Mode = 3 Median - 2 Mean**

**Explanation:** This is the empirical formula connecting mean, median and mode.

✓ **Correct Answer: (c)**

**Answer 7: (a) 0**

**Step 1:** Modal class (highest frequency = 10):

Modal class = 40-50, lower limit = 40

**Step 2:** Find median class:

$N = 34$ ,  $N/2 = 17$

Cumulative frequencies: 4, 10, 18, 28, 34

Median class = 30-40, upper limit = 40

**Step 3:** Difference =  $40 - 40 = 0$

✓ **Correct Answer: (a) 0**

**Answer 8: (b) 105**

**Formula:** Class mark =  $(\text{Upper limit} + \text{Lower limit})/2$

**Calculation:** Class mark =  $(90 + 120)/2 = 210/2 = 105$

✓ **Correct Answer: (b) 105**

**Answer 9: (a) Both A and R are true and R is the correct explanation of A**

**Verification of Assertion:**

First 10 odd natural numbers: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19

Sum =  $100 = 10^2$  (using formula  $n^2$ )

Mean =  $100/10 = 10$  ✓

**Verification of Reason:**

Sum of first  $n$  odd natural numbers =  $n^2$  ✓

Reason correctly explains why the mean is 10.

✓ **Correct Answer: (a)**

**Answer 10: (b) Both A and R are true but R is not the correct explanation of A**

**Assertion A:** Mean =  $\Sigma f_i x_i / \Sigma f_i$  is TRUE (formula for mean)

**Reason R:** Class mark is mid-point of limits is TRUE

However, R doesn't explain A. It just defines what  $x_i$  represents, not why the formula works.

✓ **Correct Answer: (b)**

**Answer 11:**

**Direct Method:**

Class	Frequency ( $f_i$ )	Class mark ( $x_i$ )	$f_i x_i$
0-10	5	5	25
10-20	10	15	150

20-30	15	25	375
30-40	8	35	280
40-50	2	45	90
<b>Total</b>	<b><math>\Sigma f_i = 40</math></b>		<b><math>\Sigma f_i x_i = 920</math></b>

$$\text{Mean} = \Sigma f_i x_i / \Sigma f_i = 920/40 = 23$$

✓ Mean = 23

### Answer 12:

**Modal class:** The class with maximum frequency

Frequencies: 6, 11, 21, 23, 14, 5

Maximum frequency = 23

✓ Modal class = 35-45 years

### Answer 13:

**Step 1:**  $f_1 + 5 + 9 + 12 + f_2 + 3 = 40$

$$f_1 + f_2 + 29 = 40$$

$$f_1 + f_2 = 11 \dots (i)$$

**Step 2:** Median = 32.5 lies in class 30-40

**Step 3:** Find cumulative frequency just before median class:

$$Cf = f_1 + 5 + 9 = f_1 + 14$$

**Step 4:** Using median formula:

$$\text{Median} = l + [(N/2 - cf)/f] \times h$$

$$32.5 = 30 + [(20 - (f_1 + 14))/12] \times 10$$

$$2.5 = [(6 - f_1)/12] \times 10$$

$$3 = 6 - f_1$$

$$f_1 = 3$$

**Step 5:** From equation (i):

$$f_2 = 11 - 3 = 8$$

✓  $f_1 = 3, f_2 = 8$

### Answer 14:

**Step 1:** Incorrect sum of observations =  $78.4 \times 25 = 1960$

**Step 2:** Correct sum =  $1960 - 69 + 96 = 1987$

**Step 3:** Correct mean =  $1987/25 = 79.48$

✓ Correct mean = 79.48

### Answer 15:

**Step 1:** Modal class (maximum frequency = 20) = 40-50

$$l = 40, f_1 = 20, f_0 = 12, f_2 = 15, h = 10$$

**Step 2:** Mode =  $l + [(f_1 - f_0)/(2f_1 - f_0 - f_2)] \times h$

**Step 3:** Mode =  $40 + [(20 - 12)/(40 - 12 - 15)] \times 10$   
 =  $40 + [8/13] \times 10$   
 =  $40 + 80/13$   
 =  $40 + 6.15$   
 = 46.15

✓ **Mode = 46.15**

**Answer 16:**

**Step 1:** Calculate cumulative frequency:

Daily Income	Frequency	Cumulative Frequency
100-120	12	12
120-140	14	26
140-160	8	34
160-180	6	40
180-200	10	50

**Step 2:**  $N = 50, N/2 = 25$

Median class = 120-140 (cf = 26, just greater than 25)

**Step 3:**  $l = 120, cf = 12, f = 14, h = 20$

Median =  $l + [(N/2 - cf)/f] \times h$   
 =  $120 + [(25 - 12)/14] \times 20$   
 =  $120 + (13/14) \times 20$   
 =  $120 + 18.57$   
 = 138.57

✓ **Median daily income = ₹138.57**

**Answer 17:**

**Given:** Mean = 45, Median = 48

**Empirical Formula:** Mode = 3 Median - 2 Mean

**Calculation:**

Mode =  $3(48) - 2(45)$   
 =  $144 - 90$   
 = 54

✓ **Mode = 54**

**Answer 18:**

**Part 1: Mean using Step Deviation Method**

Let assumed mean  $A = 225, h = 50$

Wages	$f_i$	$x_i$	$u_i = (x_i - 225)/50$	$f_i u_i$
100-150	10	125	-2	-20

150-200	18	175	-1	-18
200-250	25	225	0	0
250-300	22	275	1	22
300-350	15	325	2	30
350-400	10	375	3	30
<b>Total</b>	<b>100</b>			<b>44</b>

$$\text{Mean} = A + (\Sigma f_i u_i / \Sigma f_i) \times h$$

$$= 225 + (44/100) \times 50$$

$$= 225 + 22 = 247$$

### Part 2: Mode

Modal class = 200-250 (highest frequency = 25)

$$l = 200, f_1 = 25, f_0 = 18, f_2 = 22, h = 50$$

$$\text{Mode} = 200 + [(25-18)/(50-18-22)] \times 50$$

$$= 200 + [7/10] \times 50$$

$$= 200 + 35 = 235$$

### Part 3: Median

$N/2 = 50$ , Median class = 200-250 (cf = 28+25 = 53 > 50)

$$l = 200, cf = 28, f = 25, h = 50$$

$$\text{Median} = 200 + [(50-28)/25] \times 50$$

$$= 200 + 44 = 244$$

✓ **Mean = ₹247, Mode = ₹235, Median = ₹244**

### Answer 19:

**(a) Modal class:** Class with maximum frequency = 42

Modal class = 40-60 years

**(b) Mode calculation:**

$$l = 40, f_1 = 42, f_0 = 28, f_2 = 30, h = 20$$

$$\text{Mode} = l + [(f_1 - f_0)/(2f_1 - f_0 - f_2)] \times h$$

$$= 40 + [(42-28)/(84-28-30)] \times 20$$

$$= 40 + [14/26] \times 20$$

$$= 40 + 10.77 = 50.77 \text{ years}$$

**(c)** Least number of patients = 10 in age group 80-100 years

✓ **(a) 40-60 years (b) 50.77 years (c) 80-100 years**

### Answer 20:

**(a) Finding x:**

$$\text{Total students: } 8 + 16 + x + 12 + 6 = 60$$

$$x + 42 = 60$$

$$x = 18$$

**Verification using mean:**

Class	$f_i$	$x_i$	$f_i x_i$
0-5	8	2.5	20
5-10	16	7.5	120

10-15	18	12.5	225
15-20	12	17.5	210
20-25	6	22.5	135
<b>Total</b>	<b>60</b>		<b>690</b>

Mean =  $690/60 = 11.5$  ✓

**(b) Median class:**

$N/2 = 30$ , cf: 8, 24, 42...

Median class = 10-15 hours

**(c) Median:**

$l = 10$ , cf = 24,  $f = 18$ ,  $h = 5$

Median =  $10 + [(30-24)/18] \times 5$

=  $10 + 1.67 = 11.67$  hours

✓ **(a)  $x = 18$  (b) 10-15 hours (c) 11.67 hours**

---

END OF ANSWER KEY

Made with ♥ by Sumeet Sahu

Visit: [uniquestudyonline.com](https://www.uniquestudyonline.com)

Unique Study Point, Amitesh Nagar, Indore, MP