UNIQUE STUDY POINT

PRACTICE PAPER 04 (2025-26)

CHAPTER 13: STATISTICS

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SUBJECT: Mathematics	**CLASS:** X	**MAX. MARKS:** 40	**DURATION:** 1½ hrs

General Instructions:

1. All questions are compulsory.
2. This question paper contains **20 questions** divided into five Sections A, B, C, D and E.
3. **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.
4. There is no overall choice.
5. Use of Calculators is not permitted.

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. The range of the data 25, 18, 20, 22, 16, 6, 17, 15, 12, 30, 32, 10, 19, 8, 11, 20 is:

(a) 10

(b) 15

(c) 18

(d) 26

2. In the formula $\bar{x} = a + h \times (\Sigma f_i u_i / \Sigma f_i)$, u_i is equal to:

(a) $(x_i + a)/h$

(b) $h(x_i - a)$

(c) $(x_i - a)/h$

(d) $(a - x_i)/h$

3. The distribution given below shows the number of wickets taken by bowlers in one-day cricket matches:

Number of wickets	Less than 15	Less than 30	Less than 45	Less than 60	Less than 75	Less than 90
Number of bowlers	2	5	9	17	39	54

The number of bowlers who have taken 45 or more but less than 60 wickets is:

(a) 22

(b) 8

(c) 17

(d) 39

4. For a given data with 60 observations, the "less than ogive" and "more than ogive" intersect at (25.5, 30).

The median of the data is:

(a) 30

(b) 25.5

(c) 55.5

(d) Cannot be determined

5. If the mean of the first n natural numbers is 5n/9, then n is:

(a) 5

(b) 7

(c) 9

(d) 10

6. Consider the data:

Class	**0-10**	**10-20**	**20-30**	**30-40**	**40-50**	**50-60**
Frequency	8	10	12	22	30	18

The modal class is:

(a) 30-40

(b) 40-50

(c) 10-20

(d) 50-60

7. While computing mean of grouped data, we assume that the frequencies are:

(a) equally distributed in all classes

(b) centred at the upper limits of the classes

(c) centred at the lower limits of the classes

(d) centred at the class marks of the classes

8. The median of first 10 prime numbers is:

(a) 11

(b) 12

(c) 13

(d) 14

9. Assertion (A): If the median of data is 350 and mean is 320, then the mode is approximately 410.
Reason (R): Mode = 3 Median - 2 Mean

(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): The sum of deviations of the observations from their mean is always zero.
Reason (R): Mean is a measure of central tendency.

(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. The mean of six numbers is 23. If one of them is excluded, the mean of remaining numbers is 20. Find the excluded number.

12. Find the mode of the following data:

Size of shoes	**3**	**4**	**5**	**6**	**7**	**8**	**9**

Number of pairs sold	4	18	25	12	5	3	2

13. If the median of the observations 10, 11, 13, 17, x+5, 20, 22, 24, 25 arranged in ascending order is 18, find the value of x.

14. The following table shows marks obtained by students:

Marks	More than 0	More than 10	More than 20	More than 30	More than 40
No. of students	40	35	28	20	10

Write the frequency distribution table for the above data.

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. The following table shows the ages of patients treated in a hospital on a particular day:

Age (in years)	10-20	20-30	30-40	40-50	50-60	60-70
Number of patients	10	18	22	16	14	8

Find the mode of the data.

16. Find the median of the following data:

Class	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	4	6	10	15	12	8	5

17. If the mean and median of a set of numbers are 8.9 and 9 respectively, find the mode.

SECTION – D

Question 18 carries 5 marks.

18. The following frequency distribution gives the monthly consumption of electricity of 80 consumers of a locality:

Monthly consumption (in units)	65-85	85-105	105-125	125-145	145-165	165-185	185-205
Number of consumers	4	5	13	20	14	8	4

Find the median, mean and mode of the data.

OR

If the median of the following frequency distribution is 46, find the missing frequencies:

Class	10-20	20-30	30-40	40-50	50-60	60-70	70-80	Total
Frequency	12	30	f_1	65	f_2	25	18	229

Also find the mode of the data.

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Mobile Phone Usage Survey

A survey was conducted to study the daily screen time (in hours) of students on mobile phones. The data collected from 70 students is given below:

Screen Time (hours)	Number of Students
0-2	5
2-4	12
4-6	20
6-8	18
8-10	10
10-12	5

Based on the above information, answer the following questions:

(a) Which class interval has the maximum number of students? **(1 mark)**

(b) Find the mode of the data. **(2 marks)**

(c) How many students spend less than 6 hours on screen? **(1 mark)**

20. Mathematics Test Scores

In a mathematics test, 100 students scored as follows:

Marks	Number of Students
0-20	5
20-40	10
40-60	25
60-80	40
80-100	20

Based on the above information, answer the following questions:

(a) Find the median class. **(1 mark)**

(b) Calculate the median marks. **(2 marks)**

(c) How many students scored 60 or more marks? **(1 mark)**

📝 DETAILED ANSWER KEY 📝
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Answer 1: (d) 26

Formula: Range = Maximum value - Minimum value

Maximum value = 32
Minimum value = 6
Range = 32 - 6 = 26

✓ **Correct Answer: (d) 26**

Answer 2: (c) $(x_i - a)/h$

Explanation: In step deviation method, $u_i = (x_i - a)/h$, where x_i is the class mark, a is the assumed mean, and h is the class width.

✓ **Correct Answer: (c)**

Answer 3: (b) 8

Explanation: Number of bowlers with 45-60 wickets = (Less than 60) - (Less than 45)
= 17 - 9 = 8

✓ **Correct Answer: (b) 8**

Answer 4: (b) 25.5

Explanation: The x-coordinate (abscissa) of the point of intersection of the less than ogive and more than ogive gives the median of the data.

✓ **Correct Answer: (b) 25.5**

Answer 5: (c) 9

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

Step 2: Given: (n+1)/2 = 5n/9
9(n+1) = 10n
9n + 9 = 10n
n = 9

✓ **Correct Answer: (c) 9**

Answer 6: (b) 40-50

Explanation: Modal class is the class with maximum frequency.
Maximum frequency = 30 in class 40-50

✓ **Correct Answer: (b) 40-50**

Answer 7: (d) centred at the class marks of the classes

Explanation: While computing mean of grouped data, we assume that all observations in each class are centered at the class mark (midpoint) of that class.

✓ Correct Answer: (d)

Answer 8: (b) 12

Step 1: First 10 prime numbers: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29

Step 2: n = 10 (even)
Median = (5th term + 6th term)/2
= (11 + 13)/2
= 24/2 = 12

✓ Correct Answer: (b) 12

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

Verification:
Mode = 3 Median - 2 Mean
= 3(350) - 2(320)
= 1050 - 640
= 410 ✓

Both assertion and reason are true, and the reason correctly explains the assertion.

✓ Correct Answer: (a)

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

Assertion: $\Sigma(x_i - \bar{x}) = 0$ is TRUE (property of mean)

Reason: Mean is a measure of central tendency is TRUE

However, R doesn't explain WHY the sum of deviations is zero. It's just a definition.

✓ Correct Answer: (b)

Answer 11:

Step 1: Sum of 6 numbers = 23 × 6 = 138

Step 2: Sum of remaining 5 numbers = 20 × 5 = 100

Step 3: Excluded number = 138 - 100 = 38

✓ Excluded number = 38

Answer 12:

Finding mode:
Number of pairs sold: 4, 18, 25, 12, 5, 3, 2
Maximum frequency = 25

Mode = Size with maximum frequency = 5

✓ Mode = Size 5

Answer 13:

Step 1: Data in ascending order: 10, 11, 13, 17, x+5, 20, 22, 24, 25
n = 9 (odd)

Step 2: Median = 5th term = x + 5
Given: Median = 18

Step 3: x + 5 = 18
x = 13

✓ x = 13

Answer 14:

Frequency Distribution Table:

Marks	Frequency
0-10	40 - 35 = 5
10-20	35 - 28 = 7
20-30	28 - 20 = 8
30-40	20 - 10 = 10
40-50	10

✓ Table shown above

Answer 15:

Step 1: Modal class = 30-40 (maximum frequency = 22)

Step 2: l = 30, f_1 = 22, f_0 = 18, f_2 = 16, h = 10

Step 3: Mode = $l + [(f_1 - f_0)/(2f_1 - f_0 - f_2)] \times h$
= $30 + [(22-18)/(44-18-16)] \times 10$
= $30 + [4/10] \times 10$
= 30 + 4 = 34 years

✓ Mode = 34 years

Answer 16:

Step 1: Calculate cumulative frequency:

Class	Frequency	CF
10-20	4	4
20-30	6	10
30-40	10	20
40-50	15	35
50-60	12	47

60-70	8	55
70-80	5	60

Step 2: N = 60, N/2 = 30
Median class = 40-50 (cf = 35 > 30)

Step 3: l = 40, cf = 20, f = 15, h = 10
Median = 40 + [(30-20)/15] × 10
= 40 + 6.67 = 46.67

✓ **Median = 46.67**

Answer 17:

Given: Mean = 8.9, Median = 9

Using empirical formula:
Mode = 3 Median - 2 Mean
= 3(9) - 2(8.9)
= 27 - 17.8
= 9.2

✓ **Mode = 9.2**

Answer 18:

Part 1: Finding Median

Consumption	Frequency	CF
65-85	4	4
85-105	5	9
105-125	13	22
125-145	20	42
145-165	14	56
165-185	8	64
185-205	4	68

N/2 = 34, Median class = 125-145
Median = 125 + [(34-22)/20] × 20 = 125 + 12 = 137 units

Part 2: Finding Mean
Using direct method: Mean = $\Sigma f_i x_i / \Sigma f_i$
= (4×75 + 5×95 + 13×115 + 20×135 + 14×155 + 8×175 + 4×195)/68
= 9300/68 = 136.76 units

Part 3: Finding Mode
Modal class = 125-145 (f = 20)
Mode = 125 + [(20-13)/(40-13-14)] × 20
= 125 + (7/13) × 20 = 125 + 10.77 = 135.77 units

✓ **Median = 137, Mean = 136.76, Mode = 135.77 units**

OR (Alternative Question):

Step 1: $f_1 + f_2 = 229 - (12+30+65+25+18) = 79$ ... (i)

Step 2: Median = 46 lies in class 40-50
cf before = $12 + 30 + f_1 = 42 + f_1$
$46 = 40 + [(114.5-(42+f_1))/65] \times 10$
$6 = [(72.5-f_1)/65] \times 10$
$39 = 72.5 - f_1$
$f_1 = 33.5 \approx 34$ (rounding to nearest integer)

Step 3: $f_2 = 79 - 34 = 45$

Step 4: Mode
Modal class = 40-50 (f = 65)
Mode = $40 + [(65-34)/(130-34-45)] \times 10$
$= 40 + (31/51) \times 10 = 40 + 6.08 = 46.08$

✓ OR: $f_1 = 34$, $f_2 = 45$, Mode = 46.08

Answer 19:

(a) Maximum students = 20 in class 4-6 hours

(b) Finding Mode:
Modal class = 4-6, l = 4, $f_1 = 20$, $f_0 = 12$, $f_2 = 18$, h = 2
Mode = $4 + [(20-12)/(40-12-18)] \times 2$
$= 4 + (8/10) \times 2$
$= 4 + 1.6 = 5.6$ hours

(c) Students with < 6 hours = 5 + 12 + 20 = 37

✓ (a) 4-6 hours (b) 5.6 hours (c) 37 students

Answer 20:

(a) Finding median class:
CF: 5, 15, 40, 80, 100
N/2 = 50, Median class = 60-80 (cf = 80 > 50)

(b) Calculating median:
l = 60, cf = 40, f = 40, h = 20
Median = $60 + [(50-40)/40] \times 20$
$= 60 + 5 = 65$ marks

(c) Students with ≥ 60 marks = 40 + 20 = 60

✓ (a) 60-80 (b) 65 marks (c) 60 students

END OF ANSWER KEY