

# UNIQUE STUDY POINT

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<b>Class:</b> VI	<b>Subject:</b> Mathematics	<b>Session:</b> 2025-26
<b>Chapter:</b> 10 - The Other Side of Zero (Integers)	<b>Time:</b> 1½ Hours	<b>Max. Marks:</b> 40

## 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 contains 10 MCQs of 1 mark each.
4. Section B contains 4 questions of 2 marks each.
5. Section C contains 3 questions of 3 marks each.
6. Section D contains 1 question of 5 marks.
7. Section E contains 2 Case Study Based questions of 4 marks each.

## SECTION A - Multiple Choice Questions (1 mark each)

**Q.1** The value of  $(-12) + (+5)$  is:

- (a) -17
- (b) -7
- (c) +7
- (d) +17

**Q.2** Which integer lies between -3 and +2?

- (a) -5
- (b) +3
- (c) 0
- (d) -4

**Q.3** What is  $(-9) - (+4)$ ?

- (a) -13
- (b) -5
- (c) +5
- (d) +13

**Q.4** The successor of -1 is:

- (a) -2
- (b) 0
- (c) +1
- (d) -0

**Q.5** Which of the following is true?

- (a)  $-10 > -5$
- (b)  $0 > -1$
- (c)  $-7 > 0$
- (d)  $-2 > +3$

**Q.6** What is  $(+6) + (-6)$ ?

- (a) +12
- (b) -12
- (c) 0
- (d) +6

**Q.7** The predecessor of 0 is:

- (a) +1
- (b) -1
- (c) 0
- (d) Does not exist

**Q.8** If the temperature drops from  $+3^{\circ}\text{C}$  to  $-5^{\circ}\text{C}$ , the change in temperature is:

- (a)  $-8^{\circ}\text{C}$
- (b)  $+8^{\circ}\text{C}$
- (c)  $-2^{\circ}\text{C}$
- (d)  $+2^{\circ}\text{C}$

**Q.9** On a number line, which number is to the left of -4?

- (a) -3
- (b) 0
- (c) -6
- (d) +2

**Q.10** What is  $(-5) - (-8)$ ?

- (a) -13
- (b) +3
- (c) -3
- (d) +13

### SECTION B - Short Answer Questions (2 marks each)

**Q.11** Write all integers between -5 and +3.

**Q.12** Find the sum of all integers from -4 to +4.

**Q.13** A shopkeeper gains ₹150 on Monday, loses ₹200 on Tuesday, and gains ₹300 on Wednesday. What is his net profit or loss? Use integers.

**Q.14** Simplify:  $(-7) + (+12) - (-5)$

### SECTION C - Short Answer Questions (3 marks each)

**Q.15** In Bela's Building of Fun, you are on Floor -3. You press the lift buttons in the following sequence: +5, -

2, +4, -6. On which floor will you finally be? Show all steps.

**Q.16** A diver is at 45 m below sea level. He ascends 20 m and then descends 15 m. At what depth is he now? Represent using integers.

**Q.17** Arrange the following integers in descending order and mark them on a number line:  
+4, -6, 0, -2, +7, -1, +3

### SECTION D - Long Answer Question (5 marks)

**Q.18** Using the token model (positive and negative tokens):

- Show how to add  $(-4) + (+6)$  using tokens. Draw the tokens and show zero pairs.
- Show how to subtract  $(+3) - (+7)$  using tokens. Explain why you need to add zero pairs.
- Verify both answers using a number line.

### SECTION E - Case Study Based Questions (4 marks each)

#### **Q.19 Case Study 1: Lift Movement in a Building**

A building has 8 floors above ground (numbered +1 to +8) and 3 floors below ground (numbered -1 to -3). The ground floor is numbered 0.

Meera enters the lift at Floor +2 and makes the following movements:

- First: Goes down 5 floors
- Second: Goes up 3 floors
- Third: Goes down 2 floors
- Fourth: Goes up 6 floors

- On which floor is Meera after the first movement? (1 mark)
- On which floor is Meera after all four movements? (1 mark)
- Write the complete expression using integers for all movements. (1 mark)
- If she wants to reach Floor +6 from her current position, should she go up or down? By how many floors? (1 mark)

#### **Q.20 Case Study 2: Temperature Variation**

The table shows temperature readings of a city for 5 days:

Day	Monday	Tuesday	Wednesday	Thursday	Friday
Temperature	-3°C	+2°C	-5°C	+1°C	-4°C

- On which day was the temperature highest and on which day was it lowest? (1 mark)
- What is the difference between the highest and lowest temperatures? (1 mark)
- What was the temperature change from Tuesday to Wednesday? (1 mark)
- If Friday's temperature rises by 7°C on Saturday, what will be Saturday's temperature? (1 mark)



## DETAILED ANSWER KEY - PAPER 02

### SECTION A - Answers to MCQs

1. (b) -7

$(-12) + (+5) = -7$  (Subtract 5 from 12 and keep the sign of the larger number)

2. (c) 0

Integers between -3 and +2 are: -2, -1, 0, +1. Among options, only 0 is present.

3. (a) -13

$(-9) - (+4) = (-9) + (-4) = -13$

4. (b) 0

Successor means the next number. The number after -1 is 0.

5. (b)  $0 > -1$

Zero is greater than all negative numbers. On the number line, 0 is to the right of -1.

6. (c) 0

$(+6) + (-6) = 0$  (A number added to its additive inverse equals zero)

7. (b) -1

Predecessor means the previous number. The number before 0 is -1.

8. (a)  $-8^{\circ}\text{C}$

Change = Final - Initial =  $(-5) - (+3) = -8^{\circ}\text{C}$  (negative means drop)

9. (c) -6

On the number line, numbers to the left are smaller.  $-6 < -4$ , so -6 is to the left of -4.

10. (b) +3

$(-5) - (-8) = (-5) + (+8) = +3$

### SECTION B - Answers to Short Answer Questions

11. Answer:

Integers between -5 and +3 are: -4, -3, -2, -1, 0, +1, +2

12. Answer: 0

Integers from -4 to +4: -4, -3, -2, -1, 0, +1, +2, +3, +4  
Sum =  $(-4) + (-3) + (-2) + (-1) + 0 + (+1) + (+2) + (+3) + (+4)$   
 $= (-4 + 4) + (-3 + 3) + (-2 + 2) + (-1 + 1) + 0 = 0$

**Each number cancels with its opposite, so the sum is 0.**

### 13. Answer: Net profit of ₹250

Monday: +150

Tuesday: -200

Wednesday: +300

Total:  $(+150) + (-200) + (+300) = +250$

**Net profit is ₹250**

### 14. Answer: +10

$(-7) + (+12) - (-5)$

$= (-7) + (+12) + (+5)$

$= (+5) + (+5)$

$= +10$

## SECTION C - Answers to Short Answer Questions

### 15. Answer: Floor -2

Starting Floor: -3

**Step 1:**  $(-3) + (+5) = +2$

**Step 2:**  $(+2) + (-2) = 0$

**Step 3:**  $(0) + (+4) = +4$

**Step 4:**  $(+4) + (-6) = -2$

**Final Answer: You will be on Floor -2**

### 16. Answer: -40 m (40 m below sea level)

Initial position: -45 m

**Step 1:** Ascends 20 m:  $(-45) + (+20) = -25$  m

**Step 2:** Descends 15 m:  $(-25) + (-15) = -40$  m

**The diver is now at -40 m (40 m below sea level)**

### 17. Answer:

**Descending order (largest to smallest):** +7, +4, +3, 0, -1, -2, -6

**Number line:**

-6 \_\_\_ -2 \_\_\_ -1 \_\_\_ 0 \_\_\_ +3 \_\_\_ +4 \_\_\_ +7

## SECTION D - Answer to Long Answer Question

### 18. Token Model and Number Line Verification:

**(a) Adding (-4) + (+6) using tokens:**

- Start with 4 negative tokens: - - - -
- Add 6 positive tokens: + + + + + +
- Make zero pairs: Match 4 negative with 4 positive
- Remaining: 2 positive tokens
- **Result:**  $(-4) + (+6) = +2$

**(b) Subtracting (+3) - (+7) using tokens:**

- Start with 3 positive tokens: + + +
- Need to remove 7 positive tokens, but we only have 3
- **Add 4 zero pairs** (4 positive + 4 negative tokens)

- Now we have: + + + + + + - - - -
- Remove 7 positive tokens
- Remaining: 4 negative tokens
- **Result: (+3) - (+7) = -4**
- **We needed zero pairs because we didn't have enough positive tokens to subtract from**

**(c) Verification using number line:**

For  $(-4) + (+6)$ :

Start at  $-4$ , move 6 steps right  $\rightarrow$  reach  $+2$  ✓

For  $(+3) - (+7)$ :

Target - Starting = Movement

This means: Starting + Movement = Target

$(+3) + (?) = \text{Result}$ , where we remove 7

$(+3) + (-7) = -4$  ✓

## SECTION E - Answers to Case Study Based Questions

### 19. Case Study 1: Lift Movement in a Building

**(i) Floor after first movement:**

Starting:  $+2$

Goes down 5 floors:  $(+2) + (-5) = -3$

**Meera is on Floor -3**

**(ii) Floor after all four movements:**

After 1st:  $-3$

After 2nd (up 3):  $(-3) + (+3) = 0$

After 3rd (down 2):  $(0) + (-2) = -2$

After 4th (up 6):  $(-2) + (+6) = +4$

**Meera is on Floor +4**

**(iii) Complete expression:**

$(+2) + (-5) + (+3) + (-2) + (+6) = +4$

**(iv) Movement to reach Floor +6:**

Current floor:  $+4$

Target floor:  $+6$

Movement:  $(+6) - (+4) = +2$

**She should go UP by 2 floors**

### 20. Case Study 2: Temperature Variation

**(i) Highest and lowest temperature days:**

Highest: Tuesday ( $+2^\circ\text{C}$ )

Lowest: Wednesday ( $-5^\circ\text{C}$ )

**(ii) Difference between highest and lowest:**

$(+2) - (-5) = +2 + 5 = 7^\circ\text{C}$

**(iii) Temperature change from Tuesday to Wednesday:**

Change =  $(-5) - (+2) = -7^\circ\text{C}$

**Temperature dropped by  $7^\circ\text{C}$**

**(iv) Saturday's temperature:**

Friday:  $-4^{\circ}\text{C}$

Rises by  $7^{\circ}\text{C}$ :  $(-4) + (+7) = +3^{\circ}\text{C}$

**Saturday's temperature will be  $+3^{\circ}\text{C}$**

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