

UNIQUE STUDY POINT

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Class: VI	Subject: Mathematics	Session: 2025-26
Chapter: 10 - The Other Side of Zero (Integers)	Time: 1½ Hours	Max. Marks: 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 additive inverse of (-8) is:

- (a) -8
- (b) $+8$
- (c) 0
- (d) $+16$

Q.2 Which of the following is the smallest integer?

- (a) -12
- (b) -5
- (c) 0
- (d) -18

Q.3 What is $(+7) + (-3)$?

- (a) $+10$
- (b) $+4$
- (c) -4
- (d) -10

Q.4 If you start from floor $+3$ and press -5 in the lift, where will you reach?

- (a) Floor $+8$
- (b) Floor -2
- (c) Floor $+2$
- (d) Floor -8

Q.5 Which statement is correct?

- (a) $-5 > -3$
- (b) $-5 < -3$
- (c) $-5 = -3$
- (d) $0 < -5$

Q.6 What is $(-4) - (-6)$?

- (a) -10
- (b) -2
- (c) +2
- (d) +10

Q.7 Zero is:

- (a) A positive integer
- (b) A negative integer
- (c) Neither positive nor negative
- (d) Both positive and negative

Q.8 The temperature is -5°C . If it rises by 8°C , what will be the new temperature?

- (a) -13°C
- (b) $+3^{\circ}\text{C}$
- (c) $+13^{\circ}\text{C}$
- (d) -3°C

Q.9 Which of the following is NOT an integer?

- (a) -7
- (b) 0
- (c) 3.5
- (d) +12

Q.10 What is $(-8) + (+8)$?

- (a) -16
- (b) +16
- (c) 0
- (d) +1

SECTION B - Short Answer Questions (2 marks each)

Q.11 Arrange the following integers in ascending order: +5, -3, 0, -7, +2, -1

Q.12 A bird is flying at a height of +150 m above sea level. A submarine is at -250 m below sea level. What is the vertical distance between them?

Q.13 Evaluate: $(-15) + (+8) + (-3)$

Q.14 Write three pairs of integers whose difference is +5.

SECTION C - Short Answer Questions (3 marks each)

Q.15 A man had ₹500 in his bank account. He withdrew ₹350 and then deposited ₹200. What is his current

balance? Write using integers.

Q.16 Starting from Floor 0, Rahul presses +3, then -5, then +7, and finally -2. On which floor does he end up? Show your work.

Q.17 The temperature at 6 AM was -2°C . It rose by 5°C by noon and then fell by 8°C by night. What was the temperature at night?

SECTION D - Long Answer Question (5 marks)

Q.18 Explain Brahmagupta's rules for addition of integers with at least three examples. Show how these rules work using a number line or token model for any one example.

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

Q.19 Case Study 1: Mountain Expedition

A mountaineering team is climbing Mount Everest. Their base camp is at sea level (0 m). They set up camps at the following heights:

- Camp 1: +6000 m
- Camp 2: +7500 m
- Camp 3: +8000 m

Meanwhile, a research submarine is exploring the Mariana Trench at -8000 m below sea level.

- What is the height difference between Camp 2 and Camp 1? (1 mark)
- What is the vertical distance between Camp 3 and the submarine? (1 mark)
- If a climber descends 2500 m from Camp 3, at what height will he be? (1 mark)
- Arrange all locations (base camp, all camps, and submarine) in ascending order of their heights. (1 mark)

Q.20 Case Study 2: Banking Transactions

Priya opened a bank account with ₹0. Her transactions for the week were:

- Monday: Deposited ₹1000 (credit)
- Tuesday: Withdrew ₹350 (debit)
- Wednesday: Withdrew ₹800 (debit)
- Thursday: Deposited ₹500 (credit)
- Friday: Withdrew ₹400 (debit)

- Write the bank balance after Monday and Tuesday. (1 mark)
- What was her balance after Wednesday? Was it positive or negative? (1 mark)
- What was her final balance at the end of Friday? (1 mark)
- How much money should she deposit to make her balance exactly ₹500? (1 mark)

DETAILED ANSWER KEY - PAPER 01

SECTION A - Answers to MCQs

1. (b) +8

The additive inverse of a number is the number that when added to it gives zero. $(-8) + (+8) = 0$

2. (d) -18

Among the given integers, -18 is the smallest as it is farthest to the left on the number line.

3. (b) +4

$(+7) + (-3) = +4$ (Starting from +7, move 3 steps backward)

4. (b) Floor -2

Starting Floor + Movement = Target Floor

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

5. (b) $-5 < -3$

On the number line, -5 is to the left of -3, so $-5 < -3$

6. (c) +2

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

Subtracting a negative number is same as adding its positive.

7. (c) Neither positive nor negative

Zero is neither positive nor negative. It is the reference point on the number line.

8. (b) $+3^{\circ}\text{C}$

$$(-5) + (+8) = +3^{\circ}\text{C}$$

9. (c) 3.5

3.5 is a decimal number, not an integer. Integers are whole numbers (positive, negative, or zero).

10. (c) 0

$(-8) + (+8) = 0$ (A number added to its inverse gives zero)

SECTION B - Answers to Short Answer Questions

11. Answer:

Ascending order (smallest to largest): -7, -3, -1, 0, +2, +5

Explanation: On the number line, numbers increase as we move from left to right. All negative numbers are smaller than zero, and all positive numbers are greater than zero.

12. Answer: 400 m

Bird's position: +150 m

Submarine's position: -250 m

Vertical distance = $(+150) - (-250) = +150 + 250 = 400$ m

Therefore, the distance between them is 400 m.

13. Answer: -10

$$\begin{aligned} & (-15) + (+8) + (-3) \\ &= (-15) + (+8) + (-3) \\ &= (-7) + (-3) \\ &= -10 \end{aligned}$$

14. Answer:

Three pairs whose difference is +5:

(i) $(+10) - (+5) = +5$

(ii) $(+7) - (+2) = +5$

(iii) $(0) - (-5) = +5$

(Any other valid pairs are also correct)

SECTION C - Answers to Short Answer Questions

15. Answer: ₹350

Step 1: Initial balance = +500

Step 2: After withdrawal: $(+500) + (-350) = +150$

Step 3: After deposit: $(+150) + (+200) = +350$

Therefore, his current balance is ₹350

16. Answer: Floor +3

Starting Floor: 0

Step 1: Press +3 $\rightarrow (0) + (+3) = +3$

Step 2: Press -5 $\rightarrow (+3) + (-5) = -2$

Step 3: Press +7 $\rightarrow (-2) + (+7) = +5$

Step 4: Press -2 $\rightarrow (+5) + (-2) = +3$

Final Answer: Rahul ends up on Floor +3

17. Answer: -5°C

Temperature at 6 AM: -2°C

Step 1: At noon: $(-2) + (+5) = +3$ °C

Step 2: At night: $(+3) + (-8) = -5$ °C

Therefore, the temperature at night was -5°C

SECTION D - Answer to Long Answer Question

18. Brahmagupta's Rules for Addition of Integers:

Brahmagupta's Rules (628 CE):

Rule 1: Adding two positive numbers

The sum is positive. Add the numbers normally.

Example: $(+5) + (+3) = +8$

Rule 2: Adding two negative numbers

The sum is negative. Add the numbers (without signs) and put a minus sign.

Example: $(-4) + (-6) = -10$

Rule 3: Adding a positive and a negative number

Subtract the smaller number from the larger number (without signs) and use the sign of the larger number.

Example: $(+7) + (-3) = +4$ ($7 > 3$, so result is positive)

Example: $(-8) + (+5) = -3$ ($8 > 5$, so result is negative)

Rule 4: Adding a number to its inverse

Example: $(+5) + (-5) = 0$

Rule 5: Adding zero

Example: $(-3) + 0 = -3$

Demonstration using Token Model:

Let's show $(+5) + (-3) = +2$

- Put 5 positive tokens (+, +, +, +, +)
- Put 3 negative tokens (-, -, -)
- Make zero pairs: 3 positive and 3 negative cancel each other
- Remaining: 2 positive tokens
- Result: +2

SECTION E - Answers to Case Study Based Questions

19. Case Study 1: Mountain Expedition

(i) Height difference between Camp 2 and Camp 1:

$(+7500) - (+6000) = +1500$ m

(ii) Vertical distance between Camp 3 and submarine:

$(+8000) - (-8000) = +8000 + 8000 = 16,000$ m

(iii) Height after descending 2500 m from Camp 3:

$(+8000) + (-2500) = +5500$ m

(iv) Ascending order of all locations:

Submarine (-8000 m), Base Camp (0 m), Camp 1 (+6000 m), Camp 2 (+7500 m), Camp 3 (+8000 m)

20. Case Study 2: Banking Transactions

(i) Balance after Monday and Tuesday:

After Monday: $0 + 1000 = ₹1000$

After Tuesday: $1000 - 350 = ₹650$

(ii) Balance after Wednesday:

$650 - 800 = -₹150$ (Negative balance)

(iii) Final balance at end of Friday:

After Thursday: $-150 + 500 = ₹350$

After Friday: $350 - 400 = -₹50$

(iv) Amount to deposit to make balance ₹500:

Current balance: $-₹50$

Required: ₹500

Amount to deposit: $500 - (-50) = 500 + 50 = ₹550$

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