MATHEMATICS

Class-VI

Topic-04

INTEGERS

INDEX		
S. No.	**Topic**	**Page No.**
1.	**Theory**	**1 –10**
2.	**Exercise-1**	**11 – 15**
3.	**Exercise-2**	**15– 16**
4.	**Exercise-3**	**16–19**
5.	**Answer Key**	**20– 22**

CHAPTER 04

INTEGERS

TERMINOLOGIES

Integers, oppositeness, ordering, absolute value, addition, subtraction, multiplication, division.

INTRODUCTION

We have studied whole number and the operation addition, subtraction, multiplication and division on them . While studying subtraction we have observed that we could subtract a smaller whole number or at most an equal whole number from another whole number
Eg. 15 - 8 = 7 ; 12 - 12 =0

To subtract larger whole number from smaller one we therefore need to discover new number
Eg. 8 - 15 ; 7 - 10

In our day-to-day life, we often come across many situations involving the use of opposites. Some of these are discussed below.

Temperature : During the winter season, the minimum temperature on a particular day, say in Chennai, may be 20°C. This means that the temperature in Chennai is higher than the melting point of ice, which is 0°C. On the same day, the minimum temperature in Shimla may be 5°C below 0°C. How do we represent this? This can be represented as -5°C, read as minus five degree centigrade.

Height : If we say that the height of a mountain is 2,000 metres, it means that the mountain top is 2,000 metres above the mean sea level. Here, mean sea level is considered to be the zero level. Similarly, the depth of an ocean, say 300 metres below the mean sea level, can be expressed as – 300 metres high. If height is considered as positive, depth is considered as negative height and vice versa.

Direction : If we consider the direction towards North as positive, then 5 metres north would mean 5 metres towards the north, while -5 metres north would mean 5 metres in the opposite direction of north, i.e., 5 metres towards the south. Similarly, the negative of south is the positive of north.

Profit and Loss : If a profit of Rs 10 is expressed as Rs (+ 10), then a loss of Rs 20 is expressed as Rs (- 20) profit. We can say that negative profit is positive loss and negative loss is positive Profit..

4.1 INTEGERS

The natural numbers 1, 2, 3, ... , etc., in the system of integers are called positive integers and are sometimes denoted as + 1, + 2, + 3, ... , etc. The numbers to the left of zero are called negative integers and are always denoted as -1, -2, -3, ... , etc. . The whole number 0 is neither a positive integer nor a negative integer, as the negative of zero is zero itself

NOTE:

The integer - 6 is read as negative 6 or minus 6 while + 6 is read as positive 6 or simply 6.

(a) Oppositeness

In our day-to-day life examples, we consider:

(a) Temperature above 0°C as positive and below 0°C as negative.

(b) In height, if the mean sea level is considered as the zero level and if the above mean sea level is positive height, then depth is negative height.

(c) In direction, if north is considered as positive, then south is negative north and Vice versa.

Illustration 4.1

If profit is considered as positive, state the following as profit :

(a) profit of Rs 50 **(b)** Loss of Rs 25

Sol. **(a)** profit of Rs. 50 is a positive quantity. So, profit is Rs (+50)

(b) Loss of Rs 25 is negative profit. Hence, loss of Rs 25 = Profit of Rs (–25)

Illustration 4.2

Indicate each by an appropriate integer

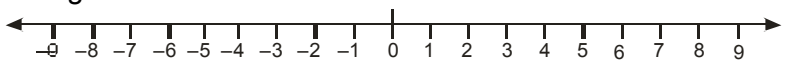
(a) 5ºF below normal temperature **(b)** 2 cm more than yesterday

(c) Spending Rs 180

Sol. **(a)** – 5 **(b)** + 2 **(c)** – 180

(b) Representation Of Integers On Number Line

Draw a number line and mark some points at equal distances on it, as shown in figure. Mark a point as '0'on it. Points to the right of zero are the positive integers and to the left are negative integers.



Clearly 1 and -1 are at equal distances from 0 , but in opposite directions. Similarly, 2 and -2 are at equal distances but in opposite directions and so on.

Every number can be represented on number line.

Illustration 4.3

Which integer in each of the following pairs is to the right of the other on the number line ?

(i) 1, 7 **(ii)** – 2, – 5 **(iii)** 0, – 3 **(iv)** – 5, 8

Sol. **(i)** 7 **(ii)** – 2 **(iii)** 0 **(iv)** 8

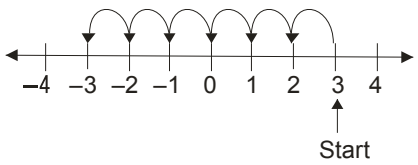
Illustration 4.4

Use a number line to answer the following questions :

(i) Which number shall we reach if we move 5 numbers to the left of 3 ?

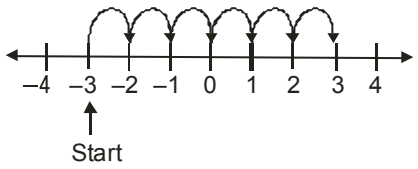
(ii) Which number shall we reach if we move 6 numbers to the right of – 3 ?

Sol. **(i)**



Moving 5 numbers to the left of 3, we reach the point –2.

(ii)



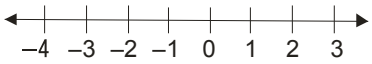
Moving 6 numbers to the right of –3, we reach the point 3.

Illustration 4.5

Write all integers between

(i) – 2 and 3 **(ii)** – 4 and 2

Sol.



(i) The integers between – 2 and 3 are –1, 0, 1, 2.

(ii) The integers between – 4 and 2 are – 3, – 2, –1, 0, 1.

(c) Ordering Of Integers

Any number on number line is greater than any **other** number appearing on its left, and any number on the number line is less than any other number on its right.

(a) Negative numbers and zero lie to the left of positive numbers, so all positive integers are greater than negative integers and zero.

i.e., $-2 < 2, -3 < 1, -4 < 3, 0 < 2$

(b) 0 (zero) lies to the right of negative integers, so 0 is always greater than the negative integers.

i.e., $-1 < 0, -2 < 0, -3 < 0, -10 < 0$

(c) In positive integers, a number with greater numerical value is greater as these are on the right side on the number line.

i.e., $22 > 20, 121 > 51$

(d) In negative integers, a number with greater numerical value is smaller as these are farther on the left side on the number line.

i.e., $-22 < -20, -121 < -51$

Illustration 4.6

Insert > or <.

(a) 8 ◯ – 8 **(b)** – 10 ◯ –6

Sol. **(a)** On the number line, – 8 is on the left of zero and 8 is on the right of zero. So, 8 is greater than – 8. So, 8 > – 8

(b) –10 is on the left of –6 on a number line.

Hence, – 10 is less than – 6.

So, – 10 < – 6

Illustration 4.7

Arrange the following integers in ascending order : – 20, –65, 25, 5, –10

Sol. The smallest number is – 65

The next one is –20.

The nest one is –10

The next one is 5 and the last one is 25.

So, the numbers in ascending order are : –65, –20, –10, 5, 25

(d) Absolute Value Of Integers

On the number line, the distance from, say, 0 to +5 is said to be 5 units. So, the absolute value of 5 is 5. Also, the distance .from 0 to -5 is 5 units. So, the absolute value of – 5 is 5. The absolute value of an integer is the distance of that integer from 0 irrespective of the direction, i.e. negative or positive.

The absolute value of 3 is written as | 3 | which is read as absolute value of 3 and is equal to 3. The absolute value of –3 is written as | – 3 | and is read as absolute value of –3 and is equal to 3.

Illustration 4.8

State the absolute values of the following.

(a) | – 82 | **(b)** | 121|

Sol. **(a)** | – 82 | = 82 **(b)** |121| = 121

The two integers are called additive inverse of each other if their sum is zero. So, –5 is the. additive inverse of 5 and 7 is the additive inverse of –7.

Ask yourself

1. Write the opposite of the following statements :

(a) 25 km below sea level **(b)** Going 20 km North

(c) Losing a weight of 5 kg **(d)** Spending Rs 300

(e) Increase in population

2. Which of the following lies to the left of other :

(a) – 2,5 **(b)** – 7, – 5 **(c)** 7 , – 6 **(d)** 100 , –87

3. Use the number line to answer the following questions :

(a) Which number shall we reach if we move 5 numbers to the left of 3?

(b) Which number shall we reach if we move 6 numbers to the right of – 3 ?

4. Write the absolute value of each of the following :

(a) 5 **(b)** – 8 **(c)** 0 **(d)** | –5400|

(e) – | – 56 |

5. Compare using < , > or =.

(a) | 3 | _____ | – 3 | **(b)** | – 8 | _____ – | 8 |

(c) – | – 45| ___ – (– 45) **(d)** |– 12| _____ – | – 12|

6. Write the following in descending order :

(a) – 32, – (– 68), |– 75| , |80| , – |52|

(b) |48| , – 47 , – | – 52| , – (– 28) , |– 50|

Answers

1. **(a)** 25 km above sea level **(b)** Going 20 km South

(c) Gaining a weight of 5 kg **(d)** Saving Rs 300

(e) Decrease in population

2. **(a)** – 2 **(b)** – 7 **(c)** – 6 **(d)** – 87

3. **(a)** – 2 **(b)** 3

4. **(a)** 5 **(b)** 8 **(c)** 0 **(d)** – 5400 **(e)** 56

5. **(a)** | 3 | = | – 3 |**(b)** | – 8 | > – | 8 | **(c)** – | – 45| < – (– 45)

(d) |– 12| > – | – 12|

6. **(a)** |80| , |– 75| , (– 68) , – 32, , – |52| **(b)** |– 50| , |48| , – (– 28) , – 47 , – | – 52|

4.2 OPERATION ON INTEGERS

(a) Addition

Rules for addition of integers

1. When adding integers with like signs (both positive or both negative), add their absolute values, and place the common sign before the sum.

2. When adding integers of unlike signs, find the difference of their absolute values, and give the result the sign of the integer with the larger absolute value.

3. When the addition and subtraction signs are placed side by side without any number in between, these two opposite signs give a negative sign.

For example,

– 3 + (–7) = – 3 – 7 = – 10

Sol. A number when added to its opposite gives zero as the result.

Illustration 4.9

Add the following

(a) 2 + 3 **(b)** 2 + (–3) **(c)** – 2 +3 **(d)** – 2 + (–3)

Sol. **(a)** 2 + 3 = (+ 2) + (+ 3) = 5

(b) 2 + (– 3) = – 3 + 2 = – 1
(Find the difference of the absolute values and since 3 is greater than 2 and it has a negative sign, the answer will be –1.)

(c) – 2 + 3 = + (3 – 2) = + 1
(Find 3 – 2 and since 3 > 2 and it is a positive integer, the answer will also be positive.)

(d) (– 2) + (– 3) = – 2 – 3 = – 5
(Add the absolute values and place the common sign which is negative or minus sign in the answer.)

(b) Subtraction

We know that subtraction is the reverse of addition.

Illustration 4.10

Consider 5 – 3. Actually we have to subtract + 3 from 5. So, we need to find a number which when added to 3 gives 5.

Sol. The answer 2, i.e., 5 – 3 = 5 + (– 3) = 2
Subtraction is the opposite of addition. We can change subtraction to addition by adding the additive inverse of the second number to the first number.

Illustration 4.11

Find 6 – (–7)

Sol. The additive inverse of – 7 is 7.
So, 6 –(–7) = 6 + (+7) = 6 + 7 = 13

Illustration 4.12

Find – 13 – (+ 5)

Sol. The additive inverse of + 5 is – 5.
So, –13 –(+ 5) = (–13) + (– 5) = – (13 + 5) = –18

Illustration 4.13

Subtract the sum of 998 and – 486 from the sum of – 290 and 732.

Sol. Sum of 998 and – 486 is 998 + (– 486) = (998 – 486) = 512
Sum of – 290 and 732 is – 290 + 732 = 732 – 290 = 442
Now, 442 – 512 = 442 +(–512) = – 70
[We subtract 442 from 512 and give minus sign to the result]

Illustration 4.14

The sum of two integers is – 396. If one of them is 64, determine the other.

Sol. Other integer = Sum – Given integer
= (– 396) – 64 = (– 396) + (–64) = – 460.

Illustration 4.15

Replace * by < or > in each of the following to make a true statement.

(i) – (6) + (–9) * (–6) – (–9) **(ii)** (–12) – (–12) * (–12) + (–12)

Sol. **(i)** Left side = (–6) + (–9) = – 15,
Right side = (–6) – (–9) = (–6) + 9 = 3
Since – 15 < 3 so the answer is <

(ii) Left side = (–12) – (–12) = (–12) + 12 = 0
Right side = (–12) + (–12) = – 24
Since 0 > – 24 so the answer is >.

Illustration 4.16

Find the value of – 12 – [(–15) + (–2) – 3].

Sol. – 12 – [(–15) + (–2) – 3]
= –12 – [(–15) + (–2) + (–3)]
= –12 – (–20) = –12 + 20 = 8.

Illustration 4.17

On a particular day, the temperature at Dehradun at 10 AM was 20ºC but by midnight , it fell down to 11ºC. The temperature at Bangaluru at 10AM on the same day was 30º C but fell down to 18º C by the midnight . Which temperature fall is greater ?

Sol. Fall in temperature at Dehradun = 20ºC – 11ºC = 9ºC
Fall in temperature at Bangaluru = 30ºC – 18ºC = 12ºC
∴ The fall in temperature at Bangaluru is greater and is 12ºC.

Points to Remember

1. The smallest positive integer is 1.

2. The greatest negative integer is –1.

3. There is no greatest positive integer and smallest negative integer.

4. The integer on the right is always greater than the one on the left.

5. For every positive integer, there exists a negative integer at the same distance from zero in the opposite direction. These two integers are called the opposites of each other. These two integers are also called additive inverse of each other as their sum is zero.

6. The absolute value of a negative or a positive integer is the positive value of the integer as it represents the distance of the number from zero.

Ask yourself

1. Add the following
(a) 180 + (– 200) **(b)** 975 + (–75)
(c) (–552) + (– 48) **(d)** (– 391) + (91) + (–150)

2. A shopkeeper had a profit of Rs 50 on Monday , a loss of Rs 20 on Tuesday and a loss of Rs 18 on Wednesday. Find his net profit or loss in these three days.

3. A car was driven 50 km due north of Delhi and then 70 km due south. How far from Delhi was the car finally ?

4. At 8 a.m. the temperature was – 2ºC . If the temperature rose 5 degrees in the next hour , what did the thermometer register at 9 a.m. ?

5. Subtract :
(a) – 6 from 16 **(b)** 51 from 50 **(c)** 75 from – 10 **(d)** 5 from – 13

6. Subtract the sum 998 and – 486 from the sum of – 290 and 732.

7. The sum of two integers is – 396. If one of them is 64, determine the other.

Answers

1. **(a)** – 20 **(b)** 900 **(c)** – 600 **(d)** – 450
2. Rs. 12 **3.** – 20 km (South) **4.** 3ºC
5. **(a)** 22 **(b)** – 1 **(c)** – 85 **(d)** – 18
6. – 70 **7.** – 460

Add your knowledge

1. MULTIPLICATION OF INTEGERS :

Rule : 1 To find the product of two integers with unlike signs. Find the product of their values regardless of their signs and give a minus sign to the product.

For example :
Find the product of $6 \times (-5)$.
Sol. $6 \times (-5) = -30$

Rule : 2 To find the product of two integers with the same sign. We find the product of their values regardless of their signs and give a plus sign to the product.

For example :
Find the product of : $(-8) \times (-14)$
Sol. $(-8) \times (-14) = (8 \times 14) = 11$

2. DIVISION OF INTEGERS :

We know that division is an inverse process of multiplication.

Rule 1 : For dividing one integer by the other, the two having unlike signs, we divide their values regardless of their signs and give a minus sign to the quotient.

For example : Evaluate $(-48) \div 12$.

Sol. $(-48) \div 12 = \frac{-48}{12} = -4$.

Rule 2 : For dividing one integer by the other having like signs. we divide their values regardless of their signs and give a plus sign to the quotient.

For example : Evaluate $(-48)\ (-16)$.

Sol. $(-48)\ (-16) = \frac{-48}{-16} = 3$.

Concept Map

Integers

Comparision of Integers

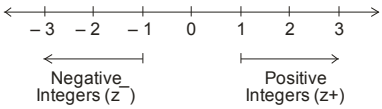
– 5 < 3 ⟶ Negative integer is less than positive integers

– 2 < 0 ⟶ O is always greater than negative integer

25 > 12 ⟶ In positive integer greater numerical value is greater

– 25 < – 12 ⟶ In negative integers greater numerical value is smaller

Integers on Number Line



Absolute Value

| 5 | = 5 , | – 50 | = 50

Operations on Integers

Addition

5 + 2 = 7

– 5 + 2 = – 3

5 + (–2) = 3

– 5 + (– 2) = – 7

Subraction

8 – (3) = 8 – 3 = 5

– 8 – (3) = – 8 – 3 = – 11

8 – (– 3) = 8 + 3 = 11

– 8 – (– 3) = – 8 + 3 = – 5

Rules

1	2	Operation	Sign
+	+	+	+
–	–	+	–
+	–	–	sign of greater value
–	+	–	sign of greater value

Summary

1. The set of integers is Z = { ..... , – 3,– 2, – 1, 0, 1, 2, 3,.....} . This is an infinite set.

2. All natural numbers are positive integers . The number 0 is neither positive nor negative.

3. All integers can be represented on a number line.

4. On the number line , all negative integers lie to left of '0' and all positive integers lie to the right of '0'.

5. The number '0' is less than every positive integer and greater than every negative integer $0 < 5$ and $0 > -5$.

6. All numbers to the left of a number are less than the number.

7. All numbers to the right of a number are greater than the number.

8. The absolute value of an integer is the numerical value of the integer regardless of its sign e.g. $|3| = 3$, $|-3| = 3$, $|0| = 0$.

9. Rules for addition of two integers :
(a) When two positive integers are added, the sum is a positive integer.
(b) When two negative integers are added their sum is equal to the sum of their numerical value, with negative sign
(c) When two integers of different sign are added , we find their difference and give the sign of integers having greater numerical value.

10. If a and b are two integers , we define a-b = a+ (-b).

EXERCISE 01

SECTION -A (FIXED RESPONSE TYPE)

OBJECTIVE QUESTIONS

1. The negative integers always lie to the _____ of positive integers on number line.
(A) right (B) left
(C) at the middle point (D) none of these

2. –2 lies to the right of which of these numbers ?
(A) 0 (B) – 3 (C) 3 (D) – 1

3. If 1 + a = 0, then a = :
(A) – 1 (B) 0 (C) 2 (D) – 2

4. How many integers lie between – 5 and 2 ?
(A) 5 (B) 2 (C) 7 (D) 6

5. 3 – 5 = 3 + ( ), then ( ) =
(A) 5 (B) – 5 (C) 2 (D) – 2

6. In which of the following pairs of integers, the first integer is not on the left of the other integer on the number line ?
(A) (– 1, 10) (B) (– 3, – 5) (C) (– 5, –3) (D) (–6, 0)

7. The integer with negative sign (-) is always less than
(A) 0 (B) – 3 (C) – 1 (D) – 2

8. An integer with positive sign (+) is always greater than
(A) 0 (B) 1 (C) 2 (D) 3

9. The successor of the predecessor of -50 is
(A) – 48 (B) – 49 (C) – 50 (D) – 51

10. The predecessor of – 5 is :
(A) – 6 (B) 4 (C) – 4 (D) 0

11. If p and q are two integers such that p is the predecessor of q, then p – q is equal to
(A) 1 (B) 0 (C) 2 (D) –1

12. If A and B represent two integers other than zero, then | A | + | B | – | B| – | A |
(A) may be negative (B) may be positive (C) may be 0 (D) must be 0

13. If A and B represent two integers other than zero, then |A| + | B |
(A) must be negative (B) must be positive (C) must be 0 (D) may be 0

14. Which statement is true ?
(A) The sum of two negative integers is positive integer.
(B) The sum of a negative integer and a positive integer is always a negative integer.
(C) The sum of two negative integers is a negative integer.
(D) The sum of three different integers can never be zero.

15. A car was driven 50 km due north of Delhi and then 70 km due south. How far from Delhi was the car finally ?
(A) 120 km due south (B) 20 km due North
(C) 120 km due North (D) 20 km due South

16. Find an integer a such that a + (–4) = 0.
(A) 0 (B) 4 (C) –4 (D) none of these

17. The integer 5 less than – 18 is :
(A) – 13 (B) – 23 (C) 12 (D) 13

18. What should be added in – 5 to get – 8 ?
(A) – 13 (B) – 3 (C) 3 (D) 13

19. What should be subtracted from – 6 to get – 4 ?
(A) – 2 (B) 0 (C) 2 (D) – 10

20. Which sum is not negative ?
(A) –38 + (–24) (B) –61 + 43 (C) – 53 + 72 (D) –25 + 0

21. The sum of two integers is 45. If one of them is –23, the other is :
(A) 68 (B) 22 (C) –68 (D) –22

22. The sum of 2 + (– 2) + 2 + (–2) + ____ (if the number of terms are 50) is :
(A) 2 (B) – 2 (C) 100 (D) 0

FILL IN THE BLANKS

1. Integers that are less than 0 are ____

2. Negative of +5 Rs is ____

3. Absolute value of -6 is ____

4. Greatest negative integer is ____

5. One less than a given integer is called its _____.

6. _____ – 1234 = – 4539

7. The additive inverse of -5 is _____

8. On subtracting -8 from 0, we get _____

9. (–7) + _____ = 0

10. 15 + _____ = 0

11. 15 + (–15) _____

12. (–5) + _____ = – 13

13. The sum of two integers is -25 . If one of them is 30 then the other is _____

TRUE / FALSE

1. The sum of two negative integers is always a negative integer

2. Every negative integer is less than every natural number.

3. The predecessor of -215 is -214

4. Absolute value of 56 is -56

5. |– 5| < |– 3|

6. The sum of three different integers can never be zero

7. The sum of 3 and -5 is 2

8. The difference of 6 and -7 is 13

9. Value of 6+(-3)-(-9) is -6

MATCH THE COLUMN

1.

	Column–I		**Column–II**
(A)	7 + |-3|	**(p)**	–370
(B)	(-7) + (-9) + 12 + (-16)	**(q)**	10
(C)	37 + (-23) + (-65) + 9 + (-12)	**(r)**	263
(D)	(-145) + 79 +(-265) + (-41) + 2	**(s)**	–54
(E)	1056 + (-798) +(-38) +44 + (-1)	**(t)**	–20

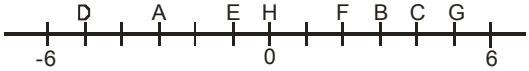
SECTION -B (FREE RESPONSE TYPE)

VERY SHORT ANSWER TYPE

1. Represent the integers on the number line.

(i) –7 **(ii)** 12 **(iii)** –10 (iv) 0
(v) 9 **(vi)** –3

2. Given below is a number line representing integers. Mark and write the integers corresponding to the following points.



(i) A **(ii)** B **(iii)** C **(iv)** D
(v) E **(vi)** F **(vii)** G **(viii)** H

Which of the following points represent a pair of opposites ?

3. Write the successor of each of the following.

(i) 6 **(ii)** –1 **(iii)** 0 **(iv)** –100

4. Write the predecessor of each of the following :

(i) 5 **(ii)** –3 **(iii)** –100 **(iv)** 0

5. Find :
(i) – 8 –11 **(ii)** – 9 – (– 12) **(iii)** 0 – (–45)

6. Find the additive inverse of :
(a) – 57 **(b)** 183 **(c)** 0 **(d)** – 105

SHORT ANSWER TYPE

7. **(i)** Write all the integers between –9 and 13 and are odd.
(ii) Write all the integers between –20 and 1 that are divisible by 4.

8. Use the number line and add the following integers.
(i) 5 + 7 **(ii)** 8 + (–8) **(iii)** (–2) + (–4) + (–5)

9. Arrange the following sets of integers in ascending order :
(i) 6,9, –4, –5, 0, 10 **(ii)** 456, 654, 645, –564, –465, –546

10. Draw a number line and answer the following questions :
(i) Which number shall we reach if we move 3 numbers to the right of –4 ?
(ii) Which number shall we reach if we move 6 numbers to the left of 1.
(iii) Which number shall we reach if we move 8 numbers to the left of 4.
(iv) Which number shall we reach if we move 10 numbers to the right of –10.
(v) If we are at –2 on the number line, in which direction shall we move to reach 7 ?
(vi) If we are at 6 on the number line, in which direction shall we move to reach –11?

11. Arrange the following sets of integers in descending order :
(i) 0, –26, 42, –50, 64, 4, –3 **(ii)** –106, –601, 116, –160, 161, –611

12. Evaluate :
(i) | –5 | + | 3 | **(ii)** | –7 | × | – 2 | **(ii)** | 17 | – | –15|
(iv) | 6 × 5 | ÷ | – 5 | **(v)** |7 – 3| × | 5 – 5 |

13. Find the least integer that could replace the in order to make the sentence
| 16 ÷ 8 | – | □ | + | –7 | = 6 true.

14. Fill in the blanks :
(i) (– 13) + (– 25) = ___ **(ii)** 2 + ___ =0
(iii) _____ + (– 9) = 0 **(iv)** _____ +(– 4) = 6

15. Subtract – 5 from 7. Subtract 7 from – 5. Are the two results the same ?

LONG ANSWER TYPE

16. Using the number line, write the integer which is :
(i) 2 more than 5 **(ii)** 4 more than – 2
(iii) 8 less than 3 **(iv)** 2 less than – 3

17. Write the following integers in an increasing order :
(i) 6, – 6– 1, 0 , 9 **(ii)** –22, 13, 0, –5, –99, – 2
(iii) –16, 16, – 362, – 500, 166 **(iv)** – 364, – 514, 103, 414, –6

18. Write the following integers in a decreasing order :

(i) 0, 8, – 2, 10, – 131, 37 **(ii)** 50, – 54, – 9, 0 – 3

(iii) – 72, – 82, 35, 0, – 6 **(iv)** – 366, – 516, 101, 412, – 8

19. Replace * by '<' or '>' in each of the following so that the statement is true :

(i) (–6) + –(9) * (–6) – (–9) **(ii)** (–12) – (–12) * (–12) + (–12)

(iii) (–20) + (–20) * 20 – 65

20. Subtract :

(i) 19 from – 36 **(ii)** – 25 from 35 **(iii)** – 38 from – 34

(iv) 86 from – 73 **(v)** 12 from 0 **(vi)** – 29 from 0

21. Find the sum :

(i) 200 + (–55) + (–77) + (–68) **(ii)** 1393 + (–407) + (–872) + 690

(iii) 703 + (–3) + (–1) + 1 + (–400) + 0 **(iv)** 2000 + 516 + (–517) – 1999

22. A hotel in Greenland is made entirely of ice. The outside temperature is –35ºC and the inside temperature of a room is –10ºC. What is the difference between the inside and outside temperature?

EXERCISE 02

SECTION -A (COMPETITIVE EXAMINATION QUESTION)

OBJECTIVE QUESTIONS

1. Number of integers lying between -1 and 1 is

(A) 1 (B) 2 (C) 3 (D) 0

2. Number of whole numbers lying between -5 and 5

(A) 10 (B) 3 (C) 4 (D) 5

3. The greatest integer lying between -10 and -15 is

(A) -10 (B) -11 (C) -15 (D) -14

4. On the number line, the integer 5 is located

(A) to the left of 0 (B) to the right of 0 (C) to the left of 1 (D) to the left of -2

5. Which expression has a value greater than -3 ?

(A) 4 + (-9) (B) 3 +(-8)+1 (C) -10+8 (D) -1+(-5)+2

6. Which of the following shows the maximum rise in temperature ?

(A) 0º C to 10ºC (B) – 4ºC to 8ºC (C) – 15ºC to -8ºC (D) – 7ºC to 0ºc

7. If the deepest point in the sea is 11,600 m below sea level and the highest mountain top is 8846 metres above sea level , then the difference in these elevation is :

(A) 2754m (B) 20,446 (C) 21,406 (D) 2952

8. If the exponent of a negative integer is even then the result is a _____ integer.

(A) positive (B) negative (C) 0 (D) None of these

9. One integer is greater than the other by + 4. If one number is – 16 then the other is
(A) + 12 (B) 0 (C) – 1 (D) – 12

10. If p and q are two integers such that p is the successor of q , then p-q is equal to
(A) 1 (B) 0 (C) 2 (D) -1

11. The statement " when an integer is added to itself , the sum is greater than the integer" is
(A) always true (B) never true
(C) true only when the integer is positive (D) true for non-negative integers

12. Amulya and Amar visited two places A and B respectively in Kashmir and recorded the minimum temperatures on a particular day as -4°C at A and -1°C at B. Which of the following statement is true ?
(A) A is cooler than B
(B) B is cooler than A
(C) There is a difference of 2°C in the temperature
(D) The temperature at A is 4°C higher than that at B.

13. 18 of [59 – {7 × 8 + (26 – 3 of 5)}]
(A) – 188 (B) + 144 (C) – 144 (D) None of these

SECTION -B (TECHIE STUFF)

14. The value of (– 20) + (– 8) ÷ (– 2) × 3 is
(A) – 8 (B) 42 (C) – 4 (D) None of these

15. The value of 25 – 5 × 2 + 3 – 8 ÷ 2 is
(A) 16 (B) 18 (C) 14 (D) 20

16. The value of 118 – [121 ÷ (11 × 11) – (– 4) – { 3 – $\overline{9-2}$ }] is
(A) – 109 (B) 109 (C) 118 (D) – 120

17. The value of $(-1)^{27} \times (-1)^{53} \times (-1)^4$ is
(A) 1 (B) 0 (C) – 1 (D) 2

18. In a class test (+ 4) marks are given for every correct answer and (– 1) marks for every incorrect answer and no marks for not attempting any question. Ram scores 12 mark after giving 6 correct answer, how many question he attempted incorrectly.
(A) 6 (B) 12 (C) 4 (D) 18

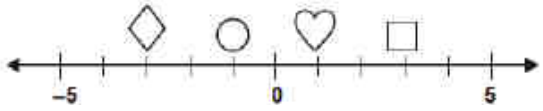
EXERCISE 03

(PREVIOUS YEAR EXAMINATION QUESTIONS)

1. – 101 _____ = 101 **(NSTSE 2009)**
(A) 1 (B) 0 (C)-1 (D) 100

2. The number of negative integers between -6 and 6 is **(NSTSE 2010)**
(A) 5 (B) 6 (C)11 (D) 12

3. Which symbol is located at -3 on the number line shown below ? **(IMO-2010)**



(A)  (B)  (C)  (D) 

4. Sara is counting by 3's. If she starts counting at -30, what are the two missing numbers? **(IMO-2010)**

–30, –27, –24, –21, ?, ?, –12

(A) -18, -15 (B) -19, -17 (C) -20, -13 (D) -22, -23

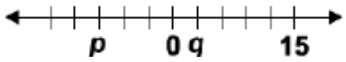
5. Two positive integers have a sum of 11. the greatest possible product of these two positive integers is **(NSTSE 2011)**

(A) 18 (B) 28 (C)30 (D) 35

6. A number line has 40 consecutive integers marked on it. If the smallest of these integers is -11, what is the largest. **(NSTSE 2011)**

(A) 29 (B) 28 (C)51 (D) 50

7. What is the value of p + q in the given number line ? **(IMO-2011)**



(A) -9 (B) – 6 (C) -3 (D) 3

8. Find the value of -12 - (-48) - [(-13) + (-8) - (-3) + 4]. **(IMO-2011)**

(A) -48 (B) 50 (C) -12 (D) 62

9. A lady parked her car on the 6t" floor and took a lift up 17 floors to the Finance Department. She then went down 9 floors to the Tax Department. On which floor would you find the lady? **(IMO-2011)**

(A) 14th (B) 15th (C) 23rd (D) 26th

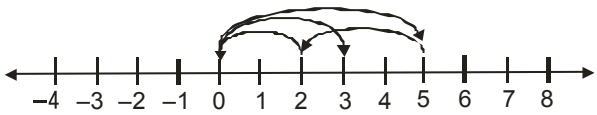
10. If the temperature of City A is -20° C and the temperature of City B is 10°C, the difference in the temperatures of the two cities is **(IMO-2011)**

(A) -30°C (B) -10°C (C) 10°C (D) 30°

11. What is the simplification of $47 - [(2+3) - 3\{ 4- 3(7 - \overline{4-3})\}]$ **(NSTSE 2012)**

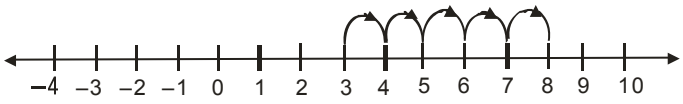
(A)100 (B) 94 (C)82 (D) 0

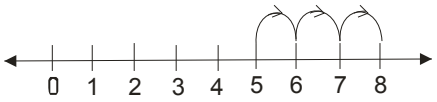
12. Which number sentence is true for the representation of integers on number line below ? **(NSTSE 2012)**

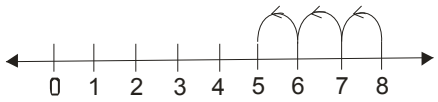


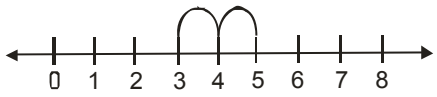
(A) 5 + 3 – 2 – 1 (B) 5+ (– 3) + 2 +(– 1)
(C) 0 + 5 + 3 – 2 – 1 (D) 0 + 5 + (– 3) + (– 2) + 3

13. Which number line correctly represent the statement "3 more than 5" ? **(NSTSE 2012)**

(A) 

(B) 

(C) 

(D) 

14. In an examination, each student is required to answer 50 questions , 5 marks are given for each correct answer and 3 marks are deducted for every wrong answer. If Geeta answered 45 questions correctly and Seeta answered 42 questions correctly, what is the difference in the total marks obtained by them ? (Note that both answered 50 questions)

(NSTSE 2012)

(A) 15 (B) 210 (C)24 (D) 186

15. A hot air balloon was 150 feet in the air. The distances it moved down and up, in feet, are shown in this list.

$$\boxed{-40, 150, -80}$$

How high in the air is the hot air balloon after moving these distances? **(IMO-2012)**

(A) - 420 feet (B) -180 feet (C) 180 feet (D) 420 feet

16. At the beginning of the month, Latika had a balance of ! 22580 in her bank account. During the month she made deposits of Rs.18250 and Rs. 27390. She withdrew Rs. 898, Rs. 1120 and Rs. 18295 to clear her bills. What was the new balance in her bank account at the end of the month? **(IMO-2012)**

(A) Rs. 12345 (B) Rs. 58659 (C) Rs. 47807 (D) Rs. 47907

17. Find the sum of the given expression (–172) + (–40) + 5 + (– 425) + (–275) + 600 – (–15) **(IMO-2012)**

(A) 315 (B) –21 (C) 40 (D) –292

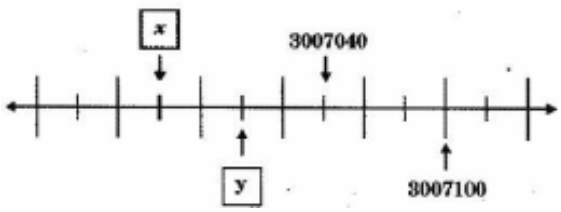
18. In a quiz show, a team scored the following scores : **(IMO-2012)**

– 30, 20, 5, – 10, 0, – 20, 10

The total score of the team is_____.

(A) –25 (B) 35 (C) 10 (D) 25

19. What is the sum of numbers x and y given on the number line? **(NSTSE 2013)**

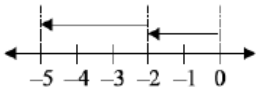


(A) 6013040 (B) 3008940 (C) 6008940 (D) 6013960

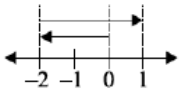
20. If a + b + c + d = 2012 and b + d = 2013, what is the value of a – b + c – d ?**(NSTSE 2013)**

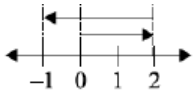
(A) – 2014 (B) – 4 (C) 2014 (D) 2

21. Which of the following represents the number line for operation 0 – (–2) – (–3)?**(IMO-2013)**

(A) 

(B) 

(C) 

(D) 

22. Arun has Rs. 125 in his savings account. He withdraws a cheque of Rs 117, makes a deposit of Rs. 45 and then withdraws another cheque for Rs. 69. Find the amount left in his account.
(write the amount as an integer). **(IMO-2013)**

(A) Rs. (-16) (B) Rs. (16) (C) Rs. (30) (D) Rs. (–30)

23. The given table shows the temperature of a country for 7 consecutive hours

Hour	1	2	3	4	5	6	7
Temperature (°C)	–6	15	–2	23	12	0	–4

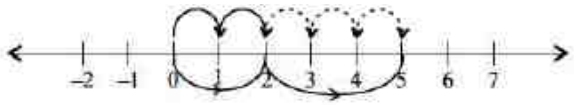
Calculate the difference between the highest and the lowest temperature of the country over the 7-hour period. **(IMO-2014)**

(A) 17°C (B) 29 °C (C) 21 °C (D) 25 °C

24. Mini has some pencils. If she gives 3 pencils to each pupil. She will have 20 pencils left. If she gives 4 pencils to each pupil. She will have none left. How many pencils does she have? **(IMO-2014)**

(A) 40 (B) 60 (C) 80 (D) 120

25. Given below number line represents **(IMO-2014)**



(A) 2 + 3 = 5 (B) 5 – 2 = 3 (C) 5 – 3 = 2 (D) 5 + 3 = 3 + 5

26. In the Gobi Desert, temperature of – 60ºF was recorded but in Sahara Desert on the same day it was 186º F. What is the difference between these two temperatures?**(IMO-2014)**

(A) 246ºC (B) 126º F (C) 126ºC (D) 246ºF

27. Rajan sold a cycle at a loss of Rs. 300. If he had sold it at Rs.3000 he would have made a profit of Rs.600.At what price did he sell the cycle.. **(IMO-2014)**

(A) Rs.2400 (B) Rs.2000 (C) Rs.2100 (D) Rs.2500

ANSWER KEY

EXERCISE 01

SECTION -A (FIXED RESPONSE TYPE)

OBJECTIVE QUESTIONS

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	B	B	A	D	B	B	A	A	C	A	D	D	B	C	D	B	B	B	A	C
Ques.	21	22																		
Ans.	A	D																		

FILL IN THE BLANKS

1. Negative Integers **2.** – 5 Rs **3.** 6 **4.** – 1

5. predecessor **6.** – 3305 **7.** 5 **8.** 8

9. 7 **10.** – 15 **11.** 0 **12.** – 8

13. – 55

TRUE / FALSE

1. True **2.** True **3.** False **4.** False

5. False **6.** False **7.** False **8.** True

9. False

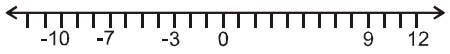
MATCH THE COLUMN

1. (A) - (q) , (B) - (t) , (C)- (s) , (D)- (p) ,(E)-(r)

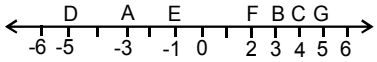
SECTION -B (FREE RESPONSE TYPE)

VERY SHORT ANSWER TYPE

1.



2.



A = –3 B = 3

C = 4 D = –5

E = –1 F = 2

G = 5 H = 0

(A, B) , (D , G)

3. **(i)** 7 **(ii)** 0 **(iii)** 1 **(iv)** –99

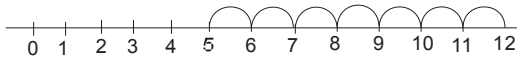
4. **(i)** 4 **(ii)** – 4 **(iii)** –101 **(iv)** –1

5. **(i)** –19 **(ii)** 3 **(iii)** 45

6. **(a)** + 57 **(b)** –183 **(c)** 0 **(d)** 105

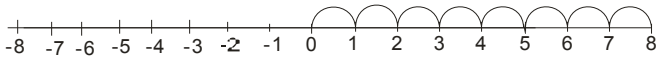
SHORT ANSWER TYPE

7. **(i)** –7, –5, – 3, –1, 1, 3, 5, 7, 9, 11 **(ii)** –16 , –12, –8, –4, 0

8. **(i)** 

5 + 7 = 12

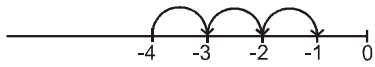
(ii) 8 + (–8)



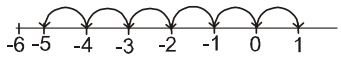
8 + (– 8) = 0

(iii) (–2) + (–4) +(–5)

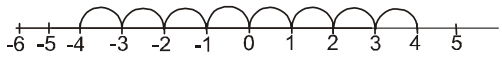
9. **(i)** –5 < –4 < 0 < 6< 9 < 10 **(ii)** –564 < – 546 < – 465 < 456 < 645 < 654

10. **(i)** 

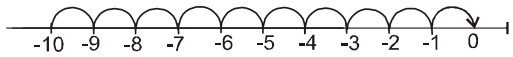
We will reach to –1

(ii) 

We will reach – 5 if we move 6 numbers to the left of 1

(iii) 

we will reach –4 if we move 8 numbers to the left of 4

(iv) 

we will reach 0 if we move 10 numbers to the right of –10

(v) Right **(vi)** left

11. **(i)** 64 > 42 > 4 > 0 > –3 > – 26 > –50

(ii) 161 > 116 >–106 > –160 > – 601 > –611

12. **(i)** 8 **(ii)** 14 **(iii)** 2

(iv) 6 **(v)** 0

13. 3, – 3 **14.** **(i)** – 38 **(ii)** – 2 **(iii)** 9 **(iv)** 10

15. No

LONG ANSWER TYPE

16. **(i)** 7 **(ii)** 2 **(iii)** – 5 **(iv)** – 5

17. **(i)** – 6– 1, 0 , 6, 9 **(ii)** –99, –22, , –5, – 2, 0 ,13

(iii) – 500, – 362, –16, 16, 166 **(iv)** – 514, – 364, –6,103, 414

18. **(i)** 37 , 10, 8,0, – 2, – 131 **(ii)** 50, 0,– 3, – 9 ,– 54

(iii) 35, 0, – 6,– 72, – 82 **(iv)** 412, 101, – 8 ,– 366, – 516

19. **(i)** < **(ii)** > **(iii)** >

20. **(i)** – 55 **(ii)** 60 **(iii)** 4

(iv) – 159 **(v)** –12 **(vi)** 29

21. **(i)** 0 **(ii)** 804 **(iii)** 300 **(iv)** 0

22. 25° C

EXERCISE 02

SECTION -A (COMPETITIVE EXAMINATION QUESTION)

MULTIPLE CHOICE QUESTIONS

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Ans.	A	D	B	B	C	B	B	A	D	A	C	A	C	A	C	B	A	B

EXERCISE 03

(PREVIOUS YEAR EXAMINATION QUESTIONS)

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	C	A	A	A	C	B	B	B	A	D	D	D	B	C	C	D	D	A	D	A
Ques.	21	22	23	24	25	26	27													
Ans.	B	A	B	C	A	D	C													