

IIST

IIT FOUNDATION

Integrated Syllabus

TEACHER'S HAND BOOK



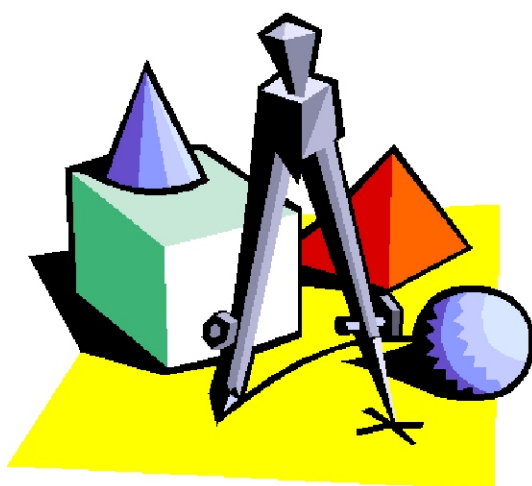
MATHEMATICS

CLASS VI

INDIAN INSTITUTE OF SOFTWARE TECHNOLOGY

C O N T E N T S

S.No.	CHAPTER NAME	Pg.
1	SETS	1
2	NATURAL AND WHOLE NUMBERS	2
3	INTEGERS	4
4	FACTORS AND MULTIPLES	5
5	FRACTIONS	8
6	DECIMALS	10
7	SQUARES AND SQUARE ROOTS	11



Exercise - 1



I. Choose the correct answer.

- Ans:** 1. Member 2. Group 3. Position 4. 5. Infinite
6. Variable 7. Variable 8. 0 9. 10. 8

II. Which of the following are well defined sets.

- Ans:** 1. No 2. Yes 3. Yes 4. Yes 5. No
6. Yes 7. Yes 8. No 9. Yes

III. Write down the following sets in roster form.

- Ans:** 1) {2, 4, 6, 8, 10, 12, 14, 16, 18} 2) {6, 7, 8, 9}
3) {2, 3, 5, 7, 11, 17, 19, 23, 29} 4) {I, N, D, A}
5) {5, 10, 15, 20, 25, 30, 35, 40, 45}

IV. Write the following sets in set builder form.

- Ans:** 1) {x : x is an odd number less than 10} 2) {x : x = y² where y is a natural no. less than 7}
3) {x : x ∈ I and x < 1} 4) {x : x is an odd no.}
5) {x : x = y³ and y ∈ N} 6) {x : x = y and y ∈ N}
7) {x : x = 3ⁿ and n ∈ N} 8) {x : x is a multiple of 5 less than 30}

V. Which of the following are null sets? (Tick the null sets and cross the not null sets).

- Ans:** 1) Not Null Set 2) Null Set 3) Not Null Set 4) Null Set
5) Null Set 6) Not Null Set 7) Not Null Set 8) Not Null Set

Application Skill Achiever



I. Complete the sets.

- Ans:** 1) S₁ = {Delhi, Mumbai, Hyderabad, Chennai}
2) S₂ = {Ganga, Yamuna, Kaveri}
3) S₃ = {Apple, Mango, Banana, Grapes}
4) S₄ = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
5) S₅ = {Earth, Mars, Mercury, Venus}

Exercise - 2



I. Choose the correct answer.

- Ans:** 1) 1 2) 3 thousands 3) 35700 4) 55599 5) Thousands
6) 54182 7) 2955 8) 4000, 700 9) 1313 10) $33427 + 41864$
11) 9374 12) 15600

II. Concept Questions.

- Ans:** 1) 1, 2, 3, 4, 5, 6, 7, 2) Unit number 3) 0, 1, 2, 3, 4, 5, 6, 7
4) Indian System 5) International System

Application Skill Achiever



I. Solve the following problems.

- Ans:** 1) Amount Shyam earns = Rs 3500
Amount he spends on buying a cell phone = Rs. 1249
The balance amount with him = Rs. 3500 - Rs. 1249 = Rs. 2251
- 2) No. of sweet boxes of Shanthi brought = 19
No. of sweets each box contains = 228
Total no. of sweets Shanthi brought = $228 \times 19 = 4332$
No. of sweets Shanthi gave to her friends = 519
No. of sweets left with her = $4332 - 519 = 3813$ (Ans)
- 3) No. of workers in a company = 15484
No. of groups made = 98
No. of workers in each group = $15484 \div 98 = 158$
- 4) Manoj divides Rs. 2565 equally among his five children.
amount each child would receive = $Rs. 2565 \div 5 = Rs. 513$
- 5) No. of Namkeen plates Sabrin prepared = 250
No. of Bhel plates she prepared = 185
Cost of Namkeen plate = Rs. 3
Cost of Bhel plate = Rs. 2
No. of Namkeen plates remained unsold = 128.
No. of Namkeen plates she sold = $250 - 128 = 122$

Cost of 122 Namkeen plates = $122 \times 3 = \text{Rs. } 366$

She sold all Bhel plates

So cost of all Bhel plates = $185 \times 2 = \text{Rs. } 370$

Total amount she earnt = $\text{Rs. } 366 + \text{Rs. } 370 = \text{Rs. } 736$

6) No. of students in IIST Abacus Education center = 9780

No. of boys = 4789

No. of girls = $9780 - 4789 = 4991$

7) The weight of a basket of apple = 500 gm

The weight of 9 baskets of apple = $500 \text{ gm} \times 9 = 4500 \text{ gm} = 4.5 \text{ kg}$

II. Explanatory questions.

Ans: 1) Smallest 4 digit number = 1000

Greatest 3 digit number = 999

Smallest 5 digit number = 10000

The sum = $1000 + 999 + 10000 = 11999$

2) The three consecutive number from 95,776 = 95,776, 95,777, 95,778

The sum = $95,776 + 95,777 + 95,778 = 2,87,331$

3) No. of men in a village = 13701

No. of women = 12962

No. of children = 6550

The population of the village = $13701 + 12962 + 6550 = 33213$

4) $240 \div (6 \times 5) = 240 \div 30 = 8$

5) Greatest 2 digit number = 99

The sum of the greatest two digit number and the difference of 14 and 9

$= 99 + (14 - 9) = 99 + 5 = 104$

6) $(715 \div 20) \times 25 = 14300 \div 25 = 572$

7) Amount for first class fare from Chennai to Mumbai = Rs. 1556

Amount for sleeper class = Rs. 496

A family of 4 members

Amount for first class for the family = $\text{Rs. } 1556 \times 4 = \text{Rs. } 6224$

Amount for sleeper class for the family = $\text{Rs. } 496 \times 4 = \text{Rs. } 1984$

If the family will choose sleeper class, then they can save = $\text{Rs. } 6224 - \text{Rs. } 1984 = \text{Rs. } 4240$

8) A day consists of 24 hours.

In the year 2005, the number of days = 365

The number of hours in the year 2005 = $365 \times 24 = 8760$ hours

In the year 2008, the number of days = 366 (Because it is a leap year)

The number of hours in the year 2008 = $366 \times 24 = 8784$ hours

the number of hours difference between the year 2005 and 2008

$$= 8784 - 8760 = 24 \text{ hours}$$

Exercise - 3



I. Choose the correct answer.

- Ans:** 1) Minus 5 2) -5 C 3) $S = -15, T = 10$ 4) $4 < -3$ 5) Back
6) -55 7) -112 8) 7 9) -2 10) -11
11) -48 12) 5 13) -17 14) B 15) -1

II. Concept Questions.

- Ans:** 1) Positive, negative or zero 2) Neither positive nor negative number
3) Bracket 4) A negative number 5) $18/2$

Application Skill Achiever



I. Solve the following problems.

- Ans:** 1) - Rs. 2180 2) -10 3) 10 C 4) 1 5) 1

Exercise - 4



I. Choose the correct answer.

1. LCM of 8, 16 and p is 48 $p = 24$ **Ans: B**

2. Common multiples of 8, 24 are 48 and 72 **Ans: C**

3. Sum of all the prime factors of x is 9.

$$2 \times 7 \times 2 = 28 \quad \text{Ans: C}$$

4. The smallest prime number between 6 and 18 is 7.

The biggest prime number between 6 and 18 is 17.

$$\text{Difference} = 17 - 7 = 10 \quad \text{Ans: D}$$

5.
$$\begin{array}{r} 7 \overline{) 14, 49} \\ \underline{2, 7} \end{array}$$
 HCF = 7 **Ans: B**

6.
$$\begin{array}{r} 2 \overline{) 150} \\ 3 \overline{) 75} \\ 5 \overline{) 25} \\ 5 \end{array}$$
 Prime factors of 150 are 2, 3, and 5. **Ans: A**

7. 3 is a common factor of 9 and x.

$$\text{So } x = 16 \quad \text{Ans: B}$$

8. Determine all the prime factors of 138.

$$\begin{array}{r} 2 \overline{) 138} \\ 3 \overline{) 69} \\ 23 \overline{) 23} \\ 1 \end{array}$$
 Prime factors are 2, 3 and 23. **Ans: A**

9. LCM of 15 & 25 is p

$$p = 75 \quad \text{Ans: D}$$

10. The sum of the prime factors of 63 is 10 **Ans: C**

11. Prime factors of 12 are 2, 3 **Ans: A**

12. LCM of 10, 15, 20 is x

$$\begin{array}{r} 2 \overline{) 10, 15, 20} \\ 5 \overline{) 5, 15, 10} \\ 1, 3, 2 \end{array}$$
 LCM = $2 \times 5 \times 3 \times 2 = 60$ **Ans: D**

13. The smallest prime number from 20 to 40 is 23

The biggest prime number from 20 to 40 is 37

$$\text{The difference} = 37 - 23 = 14 \quad \text{Ans: A}$$

14.
$$\begin{array}{r|l} 2 & 100 \\ \hline 2 & 50 \\ \hline 5 & 25 \\ \hline & 5 \end{array}$$
 Prime factors of 100 are 2 and 5 **Ans: B**

15. For the sequence 2, 6, 10, x, 18, the value of x is 14. **Ans: B**

16. The next prime number after 23 is 29, so $x = 29$.

The next prime number after 41 is 43, so $y = 43$.

so $x + y = 29 + 43 = 72$ **Ans: C**

17.
$$\begin{array}{r|l} 2 & 6, 14, 16 \\ \hline & 3, 7, 8 \end{array}$$
 LCM = $2 \times 3 \times 7 \times 8 = 336$ **Ans: D**

18. 7 and 9 are factors of x.

$x = 7 \times 9 = 63$ **Ans: A**

19. 67, 61, p, q, r, s, 41

67, 61, 59, 53, 47, 43, 41 $q = 53$ **Ans: B**

20. The lowest common multiple of 3, 6 and x is 24.

$x = 8$ **Ans: D**

21. Common multiples of 20 and 30 are 60, 120. **Ans: C**

22. $36 = 2 \times 2 \times 3 \times 3$, $2 + 3 = 5$ **Ans: A**

23. 19, x, 29, 31, y, 41, 43

19, 23, 29, 31, 37, 41, 43 $x + y = 23 + 37 = 60$ **Ans: A**

24. The prime factors are 2, 3 **Ans: D**

II. Concept Questions.

1. **Ans: A**

2. **Ans: B**

3. **Ans: B**

4. **Ans: A**

5. **Ans: A**

Application Skill Achiever



I. Solve the following problems.

1. Lowest common multiple of 2, 5 and 11 = $2 \times 5 \times 11 = 110$

2.
$$\begin{array}{r} 2 \overline{) 6, 8} \\ 3, 4 \end{array}$$
 LCM = $2 \times 3 \times 4 = 24$

3. Factors of 81 = 1, 3, 9, 27, 81

4.
$$\begin{array}{r} 2 \overline{) 72} \\ 2 \overline{) 36} \\ 2 \overline{) 18} \\ 3 \overline{) 9} \\ 3 \end{array}$$
 Prime factors of 72 is 2 and 3.

5.
$$\begin{array}{r} 3 \overline{) 12, 27} \\ 4, 9 \end{array}$$
 Common factors of 12 and 27 = 3

6.
$$\begin{array}{r} 3 \overline{) 3, 6, 7} \\ 1, 2, 7 \end{array}$$
 LCM = $3 \times 2 \times 7 = 42$

7.
$$\begin{array}{r} 3 \overline{) 6, 11, 18} \\ 2 \overline{) 2, 11, 6} \\ 1, 11, 3 \end{array}$$
 LCM = $3 \times 2 \times 11 \times 3 = 198$

8.
$$\begin{array}{r} 2 \overline{) 8, 12, 20} \\ 2 \overline{) 4, 6, 10} \\ 2, 3, 5 \end{array}$$
 LCM = $2 \times 2 \times 2 \times 3 \times 5 = 120$

9. $258 - 6 = 252$
$$\begin{array}{r} 2 \overline{) 252, 576} \\ 2 \overline{) 126, 288} \\ 3 \overline{) 63, 144} \\ 21, 48 \end{array}$$
 HCF = $2 \times 2 \times 3 = 12$
 $584 - 8 = 576$

The largest number is 12 which divides both 258 and 584 leaving remainders 6 and 8 respectively.

10.
$$\begin{array}{r} 3 \overline{) 216, 72, 81} \\ 3 \overline{) 72, 24, 27} \\ 24, 8, 9 \end{array}$$
 HCF = $3 \times 3 = 9$

The rod length = 9 m

To measure length 216 m, number of rods required = $216 / 9 = 24$

To measure length 72 m, number of rods required = $72 / 9 = 8$

To measure length 81 m, number of rods required = $81 / 9 = 9$

Exercise - 5



I. Choose the correct answer.

1. **Ans: D**

2. $399/500 = 0.798$ **Ans: D**

3. **Ans: B**

4. **Ans: C**

5. $\frac{1}{3} \frac{3}{4} \frac{5}{6} \frac{4}{12} \frac{9}{12} \frac{10}{12} \frac{23}{12} 1\frac{11}{12}$ **Ans: D**

6. $7\frac{3}{4} 4\frac{3}{4} 4\frac{3}{5} \frac{31}{4} \frac{19}{4} \frac{23}{5} \frac{155}{20} \frac{95}{20} \frac{92}{20} \frac{158}{20} 7\frac{18}{12}$ **Ans: A**

7. $3\frac{1}{5} \frac{5}{8} \frac{16}{5} \frac{5}{8} 2$ **Ans: D**

8. $30 \frac{2}{7} \frac{2}{21} 30 \frac{2}{7} \frac{21}{2} 30 3 27$ **Ans: D**

9. $\frac{1}{5} \frac{1}{10} \frac{1}{18} \frac{1}{5} \frac{10}{1} \frac{1}{18} 2 \frac{1}{18} \frac{1}{9}$ **Ans: D**

10. $\frac{3}{4} \frac{5}{8} \frac{1}{16} \frac{6}{8} \frac{5}{1} \frac{16}{8} \frac{11}{8} 16 22$ **Ans: A**

11. $7\frac{2}{9} \frac{1}{3} \frac{5}{9} \frac{65}{9} \frac{3}{9} \frac{5}{9} \frac{65}{9} \frac{8}{9} \frac{65}{9} \frac{9}{8} \frac{65}{8} 8\frac{1}{8}$ **Ans: C**

12. $10\frac{2}{7} \frac{3}{4} \frac{5}{8} \frac{72}{7} \frac{6}{8} \frac{5}{8} \frac{72}{7} \frac{11}{8} \frac{99}{7} 14\frac{1}{7}$ **Ans: C**

13. $\frac{4}{9} \frac{1}{9} 3\frac{1}{3} \frac{4}{9} \frac{1}{9} \frac{10}{3} \frac{4}{9} \frac{1}{9} \frac{30}{9} \frac{33}{9} \frac{11}{3} 3\frac{2}{3}$ **Ans: A**

14. $\frac{3}{8} \frac{5}{3} \frac{1}{6} \frac{3}{8} \frac{10}{6} \frac{1}{6} \frac{3}{8} \frac{9}{6} \frac{3}{8} \frac{6}{9} \frac{1}{4}$ **Ans: A**

II. Concept Questions.

1. **Ans: A**

2. **Ans: A**

3. **Ans: B**

4. **Ans: C**

5. **Ans: A**

Application Skill Achiever



I. Solve the following problems.

1. Asri completed his assessment on Monday = $\frac{1}{5}$

Completed on Tuesday = $\frac{3}{4}$

$$\text{Asri complete his assessment in the two days} = \frac{1}{5} + \frac{3}{4} = \frac{4}{20} + \frac{15}{20} = \frac{19}{20}$$

2. Length of a rope = $36\frac{1}{3}$ m $\frac{109}{3}$ m

The rope was cut into three parts measuring $12\frac{2}{5}$ m, $13\frac{1}{2}$ m and $5\frac{4}{15}$ m respectively.

$$\text{So, the length of rope is left} = 36\frac{1}{3} - 12\frac{2}{5} - 13\frac{1}{2} - 5\frac{4}{15}$$

$$\frac{109}{3} - \frac{62}{5} - \frac{27}{2} - \frac{79}{15}$$

$$\frac{1090}{30} - \frac{372}{30} - \frac{405}{30} - \frac{158}{30} = \frac{155}{30} = \frac{31}{6} = 5\frac{1}{6}$$

3. Anu had amount = Rs. 150

Anu gave $\frac{3}{5}$ of this to Rajani.

$$\text{Rajani got amount} = 150 \times \frac{3}{5} = \text{Rs. } 90$$

$$\text{Now Anu have money} = 150 - 90 = \text{Rs. } 60$$

Rajani gave $\frac{1}{2}$ of the money she received to Narmada.

$$\text{Narmada got amount} = 90 \times \frac{1}{2} = \text{Rs. } 45$$

Narmada also received $\frac{1}{2}$ of the money that Anu had left.

$$\text{Narmada received amount from Anu} = 60 \times \frac{1}{2} = \text{Rs. } 30$$

$$\text{Narmada received total amount} = \text{Rs. } 45 + \text{Rs. } 30 = \text{Rs. } 75$$

4. Number of students in a class = 50

$\frac{2}{5}$ of them travel by bus.

10 students travel by car.

$$\text{number of students travel by bus} =$$

$$\text{Number of students go by walk} = 50 - 20 - 10 = 20$$

$$\text{So the fraction of students walk} = \frac{2}{5}$$

- 5) 15

- 6) Rs. 220

II. Brain Works

1. Shade 10 parts. 2. $\frac{11}{24}$ 3. $\frac{7}{11}$ 4. $\frac{6}{8}$ or $\frac{3}{4}$ 5. $\frac{10}{35}$ or $\frac{2}{7}$
6. $\frac{6}{10}$ or $\frac{3}{5}$ 7. $\frac{20}{100}$ or $\frac{1}{5}$ part 8. $18 \frac{1}{2}$ 18 $\frac{2}{1}$ 36 inch
9. $\frac{3}{10}$ 10. $\frac{2}{3}$

Exercise - 6



I. Choose the correct answer.

- Ans:** 1) 7.932 2) 18.99 3) .00243 4) 4.68 5) 1.3
- 6) .02 7) None of these 8) None of these
- 9) .0003 10) 0.1 11) 2
- 12) 0.00072 13) .0005 14) None of these
- 15) 0.12 16) None of these 17) $\frac{7}{100}$ 18) $\frac{999}{10,000}$

II. Concept questions.

- 1) Zero point four five
- 2) The decimal point must be in the same column(below other decimal)
- 3) $305/100$
- 4) tenths place
- 5) The decimal point will be at Two digits from right
- 6) 0.0054 7) 0.019 8) 12.53 9) 1.844 10) $\frac{9}{1000}$

Application Skill Achiever



- 1) sum of two decimal number = 9.45.
one number = 2.21
The other number = $9.45 - 2.21 = 7.24$
- 2) The product of two numbers = 4.62
One of the number = 2.1
The other number = $4.62 \div 2.1 = 2.2$

3) When a number is divided by 2.3 the quotient is 5.73.

$$\text{The number} = 2.3 \times 5.73 = 13.179$$

4) The sum of three decimal number is 41.291.

The sum of first two number is 21.21.

$$\text{The third number} = 41.291 - 21.21 = 20.081$$

5) 2.4, 2.8, 2.8

Exercise - 7



I. Fill in the blanks.

- Ans:** 1) .09 2) $\frac{16}{81}$ 3) $\frac{121}{4}$ 4) 4,164 5) 9 and 16
6) 33.524 7) 8 8) 0.75 9) greater than 20
10) $2\frac{1}{2}$ 11) $\frac{3}{5}$ 12) $\frac{2}{5}$ 13) 20
14) Given that $\sqrt{4.8} = 2.191$ and $\sqrt{48} = 6.928$, find the value of $\sqrt{4,800}$ $\sqrt{480} = 47.37$
15) 80 and 90 16) 1 17) 20 and 30 18) 9

II. Concept questions.

- 1) The product of the number with itself
2) Square the numerator and square the denominator.
3) Always positive 4) Whole number 5) Both 5 and -5

Application Skill Achiever



I. Solve the following problems.

- Ans:** 1) 6.45cm^2 2) 18 cm 3) 655.7 4) 0.029
5) 392.68 6) 33.30 7) 6,452 8) 88.29