

### TEXT BOOK EXERCISE 6.4

Q. 1. Cube of a number is 64. Find the number.

Solution. Let the number =  $x$

Its Cube =  $x \times x \times x = x^3$

$$\therefore x^3 = 64 = \underline{2 \times 2 \times 2} \times \underline{2 \times 2 \times 2}$$

$$\sqrt[3]{x^3} = \sqrt[3]{\underline{2 \times 2 \times 2} \times \underline{2 \times 2 \times 2}}$$

$$\Rightarrow x = 2 \times 2 = 4$$

2	64
2	32
2	16
2	8
2	4
2	2
	1

Hence, the required number is 4 Ans.

**Q. 2.** Cube of a number is 3375. Find the number.

**Solution.** Let the number =  $x$

Its cube =  $x^3$

$$\therefore x^3 = 3375 = \underline{3 \times 3 \times 3} \times \underline{5 \times 5 \times 5}$$

$$\sqrt[3]{x^3} = \sqrt[3]{\underline{3 \times 3 \times 3} \times \underline{5 \times 5 \times 5}}$$

$$\Rightarrow x = 3 \times 5 = 15$$

3	3375
3	1125
3	375
5	125
5	25
5	5
	1

Hence, the required number = 15 Ans.

**Q. 3.** Find the cube root of each of the following numbers by prime factorisation :

(i) 5832

(ii) 216000

(iii) 456533

(iv) 729000

(v) 85184

(vi) 328509

**Solution.** (i) Let us find prime factorisation of 5832.

2	5832
2	2916
2	1458
3	729
3	243
3	81
3	27
3	9
3	3
	1

The prime factorisation of 5832 is :

$$5832 = \underline{2 \times 2 \times 2} \times \underline{3 \times 3 \times 3} \times \underline{3 \times 3 \times 3}$$

$$\text{Hence, } \sqrt[3]{5832} = \sqrt[3]{\underline{2 \times 2 \times 2} \times \underline{3 \times 3 \times 3} \times \underline{3 \times 3 \times 3}}$$

$$= 2 \times 3 \times 3$$

$$= 18 \text{ Ans.}$$

(ii) Let us find prime factorisation of 216000

2	216000
2	108000
2	54000
2	27000
2	13500
2	6750
3	3375
3	1125
3	375
5	125
5	25
5	5
	1

The prime factorisation of 216000 is :

$$216000 = \underline{2 \times 2 \times 2} \times \underline{2 \times 2 \times 2} \times \underline{3 \times 3 \times 3} \times \underline{5 \times 5 \times 5}$$

Hence,  $\sqrt[3]{216000}$

$$= \sqrt[3]{\underline{2 \times 2 \times 2} \times \underline{2 \times 2 \times 2} \times \underline{3 \times 3 \times 3} \times \underline{5 \times 5 \times 5}}$$

$$= 2 \times 2 \times 3 \times 5 = 60 \text{ Ans.}$$

(iii) Let us find prime factorisation of 456533.

7	456533
7	65219
7	9317
11	1331
11	121
11	11
	1

The prime factorisation of 456533 is :

$$456533 = \underline{7 \times 7 \times 7} \times \underline{11 \times 11 \times 11}$$

$$\text{Hence, } \sqrt[3]{456533} = \sqrt[3]{\underline{7 \times 7 \times 7} \times \underline{11 \times 11 \times 11}}$$

$$= 7 \times 11 = 77 \text{ Ans.}$$

(iv) Let us find prime factorisation of 729000.

2	729000
2	364500
2	182250
3	91125
3	30375
3	10125
3	3375
3	1125
3	375
5	125
5	25
5	5
	1

The prime factorisation of 729000 is :

$$729000 = \underbrace{2 \times 2 \times 2}_{2^3} \times \underbrace{3 \times 3 \times 3}_{3^3} \times \underbrace{3 \times 3 \times 3}_{3^3} \times \underbrace{5 \times 5 \times 5}_{5^3}$$

Hence,  $\sqrt[3]{729000}$

$$= \sqrt[3]{2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 5 \times 5 \times 5}$$

$$= 2 \times 3 \times 3 \times 5 = 90 \text{ Ans.}$$

(v) Let us find prime factorisation of 85184.

2	85184
2	42592
2	21296
2	10648
2	5324
2	2662
11	1331
11	121
11	11
	1

The prime factorisation of 85184 is :  
 $85184 = \underbrace{2 \times 2 \times 2}_{2^3} \times \underbrace{2 \times 2 \times 2}_{2^3} \times \underbrace{11 \times 11 \times 11}_{11^3}$

Hence,  $\sqrt[3]{85184}$

$$= \sqrt[3]{2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 11 \times 11 \times 11}$$

$$= 2 \times 2 \times 11 = 44 \text{ Ans.}$$

(vi) Let us find prime factorisation of 328509.

3	328509
3	109503
3	36501
23	12167
23	529
23	23
	1

The prime factorisation of 328509 is :

$$328509 = \underbrace{3 \times 3 \times 3}_{3^3} \times \underbrace{23 \times 23 \times 23}_{23^3}$$

Hence,  $\sqrt[3]{328509} = \sqrt[3]{3 \times 3 \times 3 \times 23 \times 23 \times 23}$   
 $= 3 \times 23 = 69 \text{ Ans.}$

#### Q. 4. Multiple Choice Questions :

(i) What is cube root of 512 ?

- (a) 2                      (b) 4  
 (c) 6                      (d) 8.

(ii) Find  $\sqrt[3]{1728}$ .

- (a) 10                      (b) 12  
 (c) 14                      (d) 16.

(iii) Find cube root of 1331.

- (a) 11                      (b) 21  
 (c) 31                      (d) 23.

(iv) A perfect cube ends with digit 2. What will be ones digit of its cube root ?

- (a) 4                      (b) 2  
 (c) 6                      (d) 8.

Ans. (i) (d) 8              (ii) (b) 12

(iii) (a) 11              (iv) (d) 8.

## Objective Type Questions

### Multiple Choice Questions :

(i) What is the digit at the unit's place of the cube of 243 ?

- (a) 3                      (b) 9  
 (c) 7                      (d) 6.

Ans. (c) 7.

(ii) Which of the following does not represent the factors of a perfect cube number ?

- (a)  $2 \times 2 \times 2 \times 3 \times 3 \times 3$   
 (b)  $4 \times 4 \times 4 \times 4 \times 4 \times 4 \times 5 \times 5 \times 5$   
 (c)  $6 \times 6 \times 6 \times 5 \times 5 \times 5 \times 5 \times 5 \times 5$   
 (d)  $2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 5 \times 5 \times 5$ .

Ans. (c)  $6 \times 6 \times 6 \times 5 \times 5 \times 5 \times 5 \times 5 \times 5$ .

(iii) Find the smallest number by which 192 be divided to make it a perfect cube.

- (a) 2 (b) 3  
(c) 5 (d) 6.

Ans. (a) 2.

(iv) How many perfect cube numbers are there from 1 to 1000 ?

- (a) 9 (b) 10  
(c) 11 (d) 12.

Ans. (b) 10.

(v) Observe the following pattern and fill in the blanks :

$$2^3 - 1^3 = 1 + 2 \times 1 \times 3$$

$$3^3 - 2^3 = 1 + 3 \times 2 \times 3$$

$$4^3 - 3^3 = 1 + 4 \times 3 \times 3$$

$$12^3 - 11^3 = \dots\dots\dots$$

- (a)  $1 + 11 \times 12 \times 4$   
(b)  $1 + 12 + 11 \times 4$   
(c)  $1 + 12 \times 11 \times 3$   
(d)  $1 + 12 \times 11 \times 5$ .

Ans. (a)  $1 + 12 \times 11 \times 3$ .

(vi) Find the cube root of 8000.

- (a) 40 (b) 80  
(c) 20 (d) 400.

Ans. (c) 20.

(vii) If  $53240 = 2 \times 2 \times 2 \times 11 \times 11 \times 11 \times 5$  then with which number 53240 is to multiply ?

- (a) 5 (b) 25  
(c) 15 (d) 22.

Ans. (b) 25.

(viii) Which of the following statement is true ?

- (a) The cube of an even number is an odd number  
(b) The cube of an odd number is an odd number  
(c) A perfect cube ends with two zeroes  
(d) The cube of a single digit number is always a single digit.

Ans. (b) The cube of an odd number is an odd number.

(ix) Cube root of 125 is :

- (a) 1 (b) 3  
(c) 5 (d) 7.

Ans. (c) 5.

(x) What is the number of zeroes at the end of a perfect cube ?

- (a) 1 (b) 2  
(c) 3 (d) 4.

Ans. (c) 3.

## 2. Choose True/False for the following questions :

(i) 1729 has been known as the Hardy-Ramanjan Number. (True/False)

Ans. True.

(ii) 125 is a cube number. (True/False)

Ans. True.

(iii) Perfect cube can have 1,4,5,6,7,9 in the ones place. (True/False)

Ans. True.

(iv) Cube root of 343 is 9. (True/False)

Ans. False.

(v) Volume of cube with side 15 cm is  $227 \text{ cm}^3$ . (True/False)

Ans. False.

## 3. Fill in the blanks :

(i) Numbers obtained when a number is multiplied by itself three times are known as ..... numbers.

Ans. cube.

(ii) The symbol  $\sqrt[3]{\quad}$  denotes .....

Ans. cube roots.

(iii) 27 is a perfect ..... number.

Ans. cube.

(iv) A cube can have ..... zero at its end.

Ans. three.

(v) A ones digit number can have ..... digit.

Ans. one.