

## 4(B)

Find the cube-roots of :-

$$\begin{aligned} \text{i. } 64 &= \sqrt[3]{64} = \sqrt{(2 \times 2 \times 2) \times (2 \times 2 \times 2)} \\ &= 2 \times 2 \\ &= 4 \quad \underline{\underline{\text{(Ans)}}} \end{aligned}$$

$$\begin{array}{r} 2 \overline{)64} \\ \underline{2} \phantom{0} \\ 4 \phantom{0} \\ \underline{4} \phantom{0} \\ 0 \phantom{0} \\ \underline{0} \phantom{0} \\ 0 \phantom{0} \\ \underline{0} \phantom{0} \\ 0 \phantom{0} \\ \underline{0} \phantom{0} \\ 0 \phantom{0} \end{array}$$

$$\begin{aligned} \text{ii. } 343 &= \sqrt[3]{343} = \sqrt{(7 \times 7 \times 7)} \\ &= 7 \quad \underline{\underline{\text{(Ans)}}} \end{aligned}$$

$$\begin{array}{r} 7 \overline{)343} \\ \underline{7} \phantom{0} \\ 4 \phantom{0} \\ \underline{4} \phantom{0} \\ 0 \phantom{0} \\ \underline{0} \phantom{0} \\ 0 \phantom{0} \end{array}$$

$$\begin{aligned} \text{iii. } 729 &= \sqrt[3]{729} = \sqrt{(3 \times 3 \times 3) \times (3 \times 3 \times 3)} \\ &= 3 \times 3 \\ &= 9 \quad \underline{\underline{\text{(Ans)}}} \end{aligned}$$

$$\begin{array}{r} 3 \overline{)729} \\ \underline{3} \phantom{0} \\ 4 \phantom{0} \\ \underline{3} \phantom{0} \\ 1 \phantom{0} \\ \underline{1} \phantom{0} \\ 0 \phantom{0} \\ \underline{0} \phantom{0} \\ 0 \phantom{0} \\ \underline{0} \phantom{0} \\ 0 \phantom{0} \end{array}$$

$$\begin{aligned} \text{iv. } 1728 &= \sqrt[3]{1728} = \sqrt{(2 \times 2 \times 2) \times 2 \times 2 \times 3 \times 3} \\ &= 2 \times 2 \times 3 \\ &= 12 \quad \underline{\underline{\text{(Ans)}}} \end{aligned}$$

$$\begin{array}{r} 2 \overline{)1728} \\ \underline{4} \phantom{0} \\ 1 \phantom{0} \\ \underline{1} \phantom{0} \\ 0 \phantom{0} \\ \underline{0} \phantom{0} \\ 0 \phantom{0} \\ \underline{0} \phantom{0} \\ 0 \phantom{0} \\ \underline{0} \phantom{0} \\ 0 \phantom{0} \end{array}$$

$$\begin{aligned} \text{v. } 9261 &= \sqrt[3]{9261} = \sqrt{(3 \times 3 \times 3) \times (7 \times 7 \times 7)} \\ &= 3 \times 7 \\ &= 21 \quad (\text{Ans}) \end{aligned}$$

$$\begin{array}{r} 29261 \\ 3 \overline{) 3087} \\ \underline{31029} \\ 7343 \\ \underline{749} \\ 7 \end{array}$$

$$\begin{aligned} \text{vi. } 4096 &= \sqrt[3]{4096} = \sqrt{(2 \times 2 \times 2) \times (2 \times 2 \times 2) \times (2 \times 2 \times 2) \times (2 \times 2 \times 2)} \\ &= 2 \times 2 \times 2 \times 2 \\ &= 16 \quad (\text{Ans}) \end{aligned}$$

$$\begin{array}{r} 2 \overline{) 4096} \\ \underline{2048} \end{array}$$

$$\begin{aligned} \text{vii. } 8000 &= \sqrt[3]{8000} = \sqrt{(2 \times 2 \times 2) \times (2 \times 2 \times 2) \times (5 \times 5 \times 5)} \\ &= 2 \times 2 \times 5 \\ &= 20 \quad (\text{Ans}) \end{aligned}$$

$$\begin{array}{r} 2 \overline{) 1024} \\ \underline{2512} \\ 256 \end{array}$$

$$\begin{aligned} \text{viii. } 3375 &= \sqrt[3]{3375} = \sqrt{(5 \times 5 \times 5) \times (3 \times 3 \times 3)} \\ &= 5 \times 3 \\ &= 15 \quad (\text{Ans}) \end{aligned}$$

$$\begin{array}{r} 2 \overline{) 128} \\ \underline{64} \\ 64 \end{array}$$

$$\begin{array}{r} 2 \overline{) 8} \\ \underline{4} \\ 4 \end{array}$$

9. Find the cube-roots of :-

$$\text{i. } \frac{27}{64} = \sqrt[3]{\frac{(3 \times 3 \times 3)}{(2 \times 2 \times 2) \times (2 \times 2 \times 2)}} = \frac{3}{2 \times 2} = \frac{3}{4} \quad (\text{Ans})$$

$$\begin{array}{r} 3 \overline{) 27} \\ \underline{9} \\ 9 \end{array}$$

$$\text{ii. } \frac{125}{216} = \sqrt[3]{\frac{(5 \times 5 \times 5)}{(2 \times 2 \times 3 \times 3)}} = \frac{5}{2 \times 3} = \frac{5}{6} \quad (\text{Ans})$$

$$\begin{array}{r} 2 \overline{) 64} \\ \underline{32} \\ 32 \end{array}$$

$$\text{iii. } \frac{343}{512} = \sqrt[3]{\frac{(7 \times 7 \times 7)}{(2 \times 2 \times 2) \times (2 \times 2 \times 2) \times (2 \times 2 \times 2)}} = \frac{7}{2 \times 2 \times 2} = \frac{7}{8} \quad (\text{Ans})$$

$$\begin{array}{r} 2 \overline{) 8} \\ \underline{4} \\ 4 \end{array}$$

$$\begin{aligned} \text{iv. } 64 \times 729 &= \sqrt[3]{(2 \times 2 \times 2) \times (6 \times 2 \times 2) \times (3 \times 3 \times 3) \times (3 \times 3 \times 3)} \\ &= 2 \times 2 \times 3 \times 3 \\ &= 36 \quad (\text{Ans}) \end{aligned}$$

$$\begin{array}{r} 5 \overline{) 125} \\ \underline{25} \\ 25 \end{array}$$

$$\begin{array}{r} 2 \overline{) 8000} \\ \underline{4000} \end{array}$$

$$\begin{array}{r} 2 \overline{) 2000} \\ \underline{1000} \end{array}$$

$$\begin{array}{r} 2 \overline{) 500} \\ \underline{250} \end{array}$$

$$\begin{array}{r} 5 \overline{) 25} \\ \underline{25} \\ 5 \end{array}$$

$$\begin{array}{r} 5 \overline{) 3375} \\ \underline{675} \end{array}$$

$$\begin{array}{r} 5 \overline{) 136} \\ \underline{327} \end{array}$$

$$\begin{array}{r} 3 \overline{) 9} \\ \underline{3} \end{array}$$

$$\begin{array}{r} 2 \overline{) 16} \\ \underline{8} \\ 8 \end{array}$$

$$\begin{array}{r} 2 \overline{) 8} \\ \underline{4} \\ 4 \end{array}$$

$$\text{vi. } 729 \times 8000 = \sqrt[3]{5,832,000} = \sqrt{(2 \times 2 \times 2) \times (2 \times 2 \times 2) \times (3 \times 3 \times 3) \times (3 \times 3 \times 3) \times (5 \times 5 \times 5)}$$

$$= 2 \times 2 \times 3 \times 3 \times 5$$

$$= 180 \text{ (Ans)}$$

$$\text{vii. } 9975 \times 512 = \sqrt[3]{17,280,000} = \sqrt{(2 \times 2 \times 2) \times (2 \times 2 \times 2) \times (2 \times 2 \times 2) \times (3 \times 3 \times 3) \times (5 \times 5 \times 5)}$$

$$= 2 \times 2 \times 2 \times 3 \times 5$$

$$= 120 \text{ (Ans)}$$

9. Find the cube-roots of :-

$$\text{i. } (-216) = \sqrt[3]{-216} = \sqrt{-(2 \times 2 \times 2) \times (3 \times 3 \times 3)} = -2 \times 3 = (-6) \text{ (Ans)}$$

$$\text{ii. } -512 = \sqrt[3]{-512} = \sqrt{-(2 \times 2 \times 2) \times (2 \times 2 \times 2) \times (2 \times 2 \times 2) \times (2 \times 2 \times 2)} = (-8) \text{ (Ans)}$$

$$\text{iii. } -1331 = \sqrt[3]{-1331} = \sqrt{-(11 \times 11 \times 11)} = -11 \text{ (Ans)}$$

$$\text{iv. } \frac{-27}{125} = \sqrt[3]{\frac{-(3 \times 3 \times 3)}{(5 \times 5 \times 5)}} = -\frac{3}{5} \text{ (Ans)}$$

$$\text{v. } \frac{-64}{343} = \sqrt[3]{\frac{-(2 \times 2 \times 2) \times (2 \times 2 \times 2)}{(7 \times 7 \times 7)}} = -\frac{2 \times 2}{7} = -\frac{4}{7} \text{ (Ans)}$$

$$\text{vi. } \frac{-512}{343} = \sqrt[3]{\frac{-(2 \times 2 \times 2) \times (2 \times 2 \times 2) \times (2 \times 2 \times 2)}{(7 \times 7 \times 7)}} = -\frac{2 \times 2 \times 2}{7} = -\frac{8}{7} \text{ (Ans)}$$

$$\text{vii. } -2197 = \sqrt[3]{-(13 \times 13 \times 13)} = -13 \text{ (Ans)}$$

$$\text{viii. } -5832 = \sqrt[3]{-(2 \times 2 \times 2) \times (3 \times 3 \times 3) \times (3 \times 3 \times 3)} = \sqrt{-2 \times 3 \times 3} = -18 \text{ (Ans)}$$

~~ix. -2700000 = \sqrt[3]{-(2 \times 2 \times 2) \times (2 \times 2 \times 2) \times (2 \times 2 \times 2) \times (2 \times 2 \times 2) \times (2 \times 2 \times 2)}~~

$$\text{ix. } -2700000 = \sqrt[3]{-(2 \times 2 \times 2) \times (2 \times 2 \times 2) \times (7 \times 7 \times 7) \times (5 \times 5 \times 5)}$$

$$= -2 \times 2 \times 7 \times 5 = -140 \text{ (Ans)}$$

$$0.8 \times 0.8 \times 0.8 = 0.512$$

4. Find the cube-roots of :-

i.  $\sqrt[3]{2.744} = 1.4$  (Ans)

ii.  $\sqrt[3]{9.261} = \sqrt[3]{(3 \times 3 \times 3) \times (7 \times 7 \times 7)}$   
 $= 3 \times 7 = 2.1$  (Ans)

iii.  $\sqrt[3]{0.000027} = \sqrt[3]{0.03}$  (Ans)

iv.  $\sqrt[3]{-0.512} = -0.8$  (Ans)

v.  $\sqrt[3]{-15.625} = -2.5$  (Ans)

vi.  $\sqrt[3]{-125 \times 1000} = \sqrt[3]{-125000} = \sqrt[3]{(2 \times 2 \times 2) \times (5 \times 5 \times 5) \times (5 \times 5 \times 5)}$   
 $= -2 \times 5 \times 5$   
 $= -50$

5. Find the smallest number by which 28244 should be divided so that the quotient is a perfect cube.

Solution

Prime factor of 28244 =  $2 \times 2 \times (3 \times 3 \times 3) \times (3 \times 3 \times 3) \times 3 \times 3$   
 $= 2 \times 2 \times 3 \times 3$   
 $= 36$  (Ans)

$\therefore 36$  must be divided to get a perfect cube.

6. What is the least number by which 30375 should be multiplied to get a perfect cube?

6. What is the least number by which 30375 should be multiplied to get a perfect cube?

Solution,

Prime factor of 30875 =  $(5 \times 5 \times 5) \times (3 \times 3 \times 3) \times 3 \times 3$

$\therefore 3$  should be multiplied to get a perfect cube. (Ans)

7. Find the cube-roots of :-

i.  $700 \times 7 \times 49 \times 5$

$$\begin{aligned} &= \sqrt[3]{343000} = (2 \times 2 \times 2) \times (5 \times 5 \times 5) \times (7 \times 7 \times 7) \\ &= 2 \times 5 \times 7 \\ &= 70 \quad \text{(Ans)} \end{aligned}$$

ii.  $-216 \times 1728$

$$\begin{aligned} &= \sqrt[3]{373248} = (2 \times 2 \times 2) \times (2 \times 2 \times 2) \times (2 \times 2 \times 2) \times (3 \times 3 \times 3) \times (3 \times 3 \times 3) \\ &= 2 \times 2 \times 2 \times 3 \times 3 \\ &= -72 \quad \text{(Ans)} \end{aligned}$$

iii.  $-64 \times -125$

$$\begin{aligned} &= \sqrt[3]{8000} = (2 \times 2 \times 2) \times (2 \times 2 \times 2) \times (5 \times 5 \times 5) \\ &= 2 \times 2 \times 5 \\ &= 20 \quad \text{(Ans)} \end{aligned}$$

iv.  $-\frac{27}{343} = -\frac{(3 \times 3 \times 3)}{(7 \times 7 \times 7)} = -\frac{3}{7} \quad \text{(Ans)}$

v.  $\frac{729}{-1331} = -\frac{(3 \times 3 \times 3) \times (3 \times 3 \times 3)}{(11 \times 11 \times 11)} = -\frac{9 \times 9}{11} = -\frac{9}{11} \quad \text{(Ans)}$

$$\begin{array}{r} 2 \overline{) 343000} \\ \underline{2 \ 71500} \\ 2 \ 5450 \\ \underline{5 \ 42875} \\ 5 \ 8575 \\ \underline{5 \ 8575} \\ 0 \\ 5 \ 1715 \\ \underline{7 \ 343} \\ 7 \ 49 \\ \underline{7} \\ 0 \end{array}$$

$$\begin{array}{r} 2 \overline{) 373248} \\ \underline{2 \ 186624} \\ 2 \ 98322 \\ \underline{2 \ 46656} \\ 2 \ 38928 \\ \underline{3 \ 11664} \\ 2 \ 5832 \\ \underline{2 \ 2916} \\ 2 \ 1458 \\ \underline{2 \ 729} \\ 2 \ 729 \\ \underline{2 \ 729} \\ 0 \\ 2 \ 81 \\ \underline{2 \ 81} \\ 0 \\ 2 \ 27 \\ \underline{2 \ 27} \\ 0 \end{array}$$

vi. 250.047

$$\begin{aligned}
 &= \sqrt[3]{250047} = \sqrt{(3 \times 3 \times 3) \times (3 \times 3 \times 3) \times (7 \times 7 \times 7)} \\
 &= 3 \times 3 \times 7 \\
 &= 63 \quad (\text{Ans})
 \end{aligned}$$

$$\begin{array}{r}
 3 \overline{) 250047} \\
 \underline{383349} \\
 327789 \\
 \underline{79261} \\
 71329 \\
 \underline{1189} \\
 327 \\
 \underline{39} \\
 3
 \end{array}$$

vii. -175616 =  $\sqrt[3]{-175616}$   ~~$(-2 \times -2 \times -2) \times (-2 \times -2 \times -2) \times (-2 \times -2 \times -2) \times (-7 \times -7 \times -7)$~~

$$\begin{aligned}
 &\sqrt[3]{(-2 \times -2 \times -2) \times (-2 \times -2 \times -2) \times (-2 \times -2 \times -2) \times (-7 \times -7 \times -7)} \\
 &= -2 \times -2 \times -2 \times -7 \\
 &= -56 \quad (\text{Ans})
 \end{aligned}$$

$$\begin{array}{r}
 2 \overline{) 175616} \\
 \underline{287808} \\
 248904 \\
 \underline{216952} \\
 210976 \\
 \underline{25488} \\
 22744 \\
 \underline{21372} \\
 2686 \\
 \underline{7343} \\
 749 \\
 \underline{77} \\
 1
 \end{array}$$

— x —