Exercise 2.3

Q. 1: change the following radical expressions to exponential and exponential to radical terms.

(i) $\sqrt[3]{-64}$ (ii) $2^{3/5}$ (iii) $-7^{1/3}$ (iv) $y^{-2/3}$

Solution:

(i) $\sqrt[3]{-64} = \sqrt[3]{-64} = (-64)^{1/3}$

(ii) $2^{3/5} = (2^3)^{1/5} = \sqrt[5]{2^3}$

(iii) $-7^{1/3} = -(7)^{1/3} = -\sqrt[3]{7}$

(iv) $y^{-2/3} = (y^{-2})^{1/3} = \sqrt[3]{y^{-2}}$

Q. 2: Tell whether the following statements are true or false?

(i) $5^{1/5} = \sqrt{5}$ (False) (ii) $2^{2/3} = \sqrt[3]{4}$ (True)

(iii) $\sqrt{49} = \sqrt{7}$ (False) (iv) $\sqrt[3]{x^{27}} = x^3$ (False)

Q. 3: Simplify the following radical expressions.

(i) $\sqrt[3]{-125} = \sqrt[3]{-5 \times -5 \times -5}$

$= \sqrt[3]{(-5)^3}$

$= (-5)^{3\times 1/3}$

$= -5$

(ii) $\sqrt[4]{32} = \sqrt[4]{2 \times 2 \times 2 \times 2 \times 2}$

$= \sqrt[4]{2^4 \times 2}$

$= 2\sqrt[4]{2}$

(iii) $\sqrt[5]{\frac{3}{32}} = \sqrt[5]{\frac{3}{2\times2\times2\times2\times2}}$

$= \frac{\sqrt[5]{3}}{2^{5\times\frac{1}{5}}}$

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

(iv) $\sqrt[3]{-\frac{8}{27}} = \sqrt[3]{\frac{-2\times-2\times-2}{3\times3\times3}}$

$= \sqrt[3]{\frac{(-2)^3}{3^3}}$

$= \left(\frac{-2}{3}\right)^{3\times 1/3}$

$= -\frac{2}{3}$