Exercise 2.3

Q.1 Write each radical expression in exponential notation and each exponential expression in radical notation. Do not simplify.

(i) $\sqrt[3]{-64}$

$= (-64)^{\frac{1}{3}}$

(ii) $2^{\frac{3}{5}}$

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

(iii) $-7^{\frac{1}{3}}$

$-\sqrt[3]{7}$

(iv) $y^{-\frac{2}{3}}$

$= \sqrt[3]{y^{-2}}$

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

(i) $5^{\frac{1}{5}} = \sqrt{5}$ **False**

(ii) $2^{\frac{2}{3}} = \sqrt[3]{4}$ **True**

(iii) $\sqrt{49} = \sqrt{7}$ **False**

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

Q.3 Simplify the following radical expression.

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

Solution:

$= \sqrt[3]{-125}$

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

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

$= -5$ **Ans**

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

Solutions:

$$= \sqrt[4]{32}$$
$$= \sqrt[4]{2\times 2\times 2\times 2\times 2}$$
$$= \sqrt[4]{2^4\times 2}$$
$$= \sqrt[4]{2^4}\times \sqrt[4]{2}$$
$$= 2\sqrt[4]{2}$$ **Ans**

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

Solution:

$$= \sqrt[5]{\frac{3}{32}}$$
$$= \frac{\sqrt[5]{3}}{\sqrt[5]{32}}$$
$$= \frac{\sqrt[5]{3}}{\sqrt[5]{2\times 2\times 2\times 2\times 2}}$$
$$= \frac{\sqrt[5]{3}}{\sqrt[5]{(2)^5}}$$
$$= \frac{\sqrt[5]{3}}{2}$$ **Ans**

(iv) $\sqrt[3]{-\frac{8}{27}}$

Solution:

$$= \sqrt[3]{-\frac{8}{27}}$$
$$= \sqrt[3]{\left(-\frac{2}{3}\right)\left(-\frac{2}{3}\right)\left(-\frac{2}{3}\right)}$$
$$= \sqrt[3]{\left(-\frac{2}{3}\right)^3}$$
$$= -\frac{2}{3}$$ **Ans**