

$$\begin{aligned}
 4 \text{ (i)} \quad & \frac{8^{-1} \times 5^3}{2^{-4}} \\
 & = \frac{2^4 \times 5^3}{8} \\
 & = \frac{2^2 \times 16 \times 125}{8} \\
 & = 250
 \end{aligned}$$

$$[\because x^{-m} = \frac{1}{x^m}, \frac{1}{x^{-m}} = x^m]$$

$$\begin{aligned}
 4 \text{ (ii)} \quad & (5^{-1} \times 2^{-1}) \times 6^{-1} \\
 & = (5 \times 2)^{-1} \times 6^{-1} \\
 & = 10^{-1} \times 6^{-1} \\
 & = (10 \times 6)^{-1} \\
 & = 60^{-1} \\
 & = \frac{1}{60}
 \end{aligned}$$

$$[\because x^m \times y^m = (xy)^m]$$

$$[\because x^{-m} = \frac{1}{x^m}]$$

$$\begin{aligned}
 5 \quad & 5^m \div 5^{-3} = 5^5 \\
 \Rightarrow & 5^{m - (-3)} = 5^5 \\
 \Rightarrow & 5^{m+3} = 5^5 \\
 \Rightarrow & m+3 = 5 \\
 \Rightarrow & m = 5-3 \\
 & = 2
 \end{aligned}$$

$$[\because x^m \div x^n = x^{m-n}]$$

[values are equal and bases are equal
 \therefore exponents are equal]