



14. The integral  $\int \frac{dx}{x^2(x^4+1)^{\frac{3}{4}}}$  equals

- (1)  $\left(\frac{x^4+1}{x^4}\right)^{1/4} + C$       (2)  $(x^4 + 1)^{\frac{1}{4}} + C$       (3)  $-(x^4 + 1)^{\frac{1}{4}} + C$       (4)  $-\left(\frac{x^4+1}{x^4}\right)^{1/4} + C$

**Answer:**

$$\int \frac{dx}{x^2(x^4 + 1)^{\frac{3}{4}}}$$

$$= \int \frac{dx}{x^2 \cdot x \left(1 + \frac{1}{x^4}\right)^{\frac{3}{4}}}$$

Putting  $u = 1 + \frac{1}{x^4}$ ,  $du = -\frac{4}{x^5} dx$  or  $-\frac{1}{4} du = \frac{dx}{x^5}$

$$= \int -\frac{du}{4 \times u^{\frac{3}{4}}} = -\int \frac{1}{4} u^{-\frac{3}{4}} du = -\frac{1}{4} \frac{u^{1/4}}{\frac{1}{4}} + C = -\left(1 + \frac{1}{x^4}\right)^{\frac{1}{4}} + C$$

**Correct Option is (4)  $-\left(\frac{x^4+1}{x^4}\right)^{1/4} + C$**