If there is an error of $k\%$ in measuring the edge of a cube, then the percent error in estimating its volume is

**a.** $k$ **b.** $3k$

**c.** $\frac{k}{3}$ **d.** none of these

**b.** $V = x^3$ and the percent error in measuring $x$ is $\frac{dx}{x} \times 100 = k$

The percent error in measuring volume $= \frac{dV}{V} \times 100$

Now, $\frac{dV}{dx} = 3x^2$

or $dV = 3x^2 dx$ or $\frac{dV}{V} = \frac{3x^2 dx}{x^3} = 3\frac{dx}{x}$

$\therefore \frac{dV}{V} \times 100 = 3\frac{dx}{x} \times 100 = 3k$