

2 JEE Main 2019 (Online) 9th April Morning Slot

MCQ (Single Correct Answer)

If the standard deviation of the numbers $-1, 0, 1, k$ is $\sqrt{5}$ where $k > 0$, then k is equal to

A $2\sqrt{6}$

B $\sqrt{6}$

C $2\sqrt{\frac{5}{6}}$

D $2\sqrt{\frac{10}{3}}$

Explanation

standard deviation = $\sqrt{5}$

\therefore Variance = $(\sqrt{5})^2 = 5$

Also variance = $\frac{\sum x_i^2}{N} - \mu^2$

Where μ = Mean = $\frac{-1+0+1+k}{4} = \frac{k}{4}$

\therefore Variance = $\frac{(-1)^2+0+1^2+k^2}{4} - \frac{k^2}{16}$

$\Rightarrow 5 = \frac{2+k^2}{4} - \frac{k^2}{16}$

$\Rightarrow 8 + 3k^2 = 80$

$\Rightarrow k^2 = 24 = 2\sqrt{6}$