

**Answer on Question #51539-Physics-Other**

Which of the following is the correct unit of  $k$  in the equation of a damped harmonic oscillator given as

$$-bv - kx = ma,$$

where  $b$  is the damping factor and all the symbols have their usual meaning?

A.  $kgms^{-2}$  B.  $kgs^{-1}$  C.  $kgms^{-1}$  D.  $kgs^{-2}$

**Solution**

We know that

$$[ma] = [kx] \rightarrow [k] = \frac{[ma]}{[x]}.$$

So,

$$[k] = \frac{kg \cdot \frac{m}{s^2}}{m} = kg \cdot s^{-2}.$$

**Answer: D.  $kgs^{-2}$ .**