Question #84939, Physics – Mechanics | Relativity

A body of mass 50g is suspended from one end of a spring whose force constant 0.8N\M the body is set into S.H.M with amplitude of 0.4m calculate

1 The period of oscillation

2 The frequency of the motion

3 Angular speed

4 maximum velocity

5 maximum acceleration

Solution

1 The period of oscillation

$$T = 2\pi\sqrt{\frac{m}{k}} = 2\pi\sqrt{\frac{0.05}{0.8}} = 1.6 \ s.$$

2 The frequency of the motion

$$f = \frac{1}{T} = \frac{1}{2\pi\sqrt{\frac{0.05}{0.8}}} = 0.64 \ Hz.$$

3 Angular speed

$$\omega = 2\pi f = \frac{1}{\sqrt{\frac{0.05}{0.8}}} = 4\frac{rad}{s}$$

4 maximum velocity

$$V = \omega A = (4)(0.4) = 1.6\frac{m}{s}$$

5 maximum acceleration

$$a = \omega^2 A = (4)^2(0.4) = 6.4\frac{m}{s^2}$$

Answer provided by https://www.AssignmentExpert.com