

Q Write the equation of S.H.M if (1) initial phase is zero (2) initial phase is 90 degree and amplitude is 5 centimetres and period is 8 second.

$$a = 5 \text{ cm}$$

$$T = 8 \text{ sec}$$

equation of S.H.M

$$x = a \sin(\omega t + \phi)$$

(a) If $\phi = 0$ (initial phase)

$$x = a \sin(\omega t + \phi)$$

$$x = a \sin(\omega t + 0)$$

~~$$x = 5 \sin(\omega t)$$~~

$$x = 5 \sin(\omega t)$$

$$x = 5 \sin(0.785t) \quad \text{--- (I)}$$

$$\omega = \frac{2\pi}{T}$$

$$\omega = \frac{2 \times 3.14}{8}$$

$$\omega = 0.785 \frac{\text{rad}}{\text{sec}}$$

(b) If $\phi = \pi/2 = 90^\circ$

$$x = a \sin(\omega t + \phi)$$

$$x = a \sin(\omega t + \pi/2)$$

$$x = 5 \sin(0.785t + \pi/2)$$

$$x = 5 \cos(0.785t) \quad \text{--- (II)}$$