

SBOA SCHOOL AND JUNIOR COLLEGE

CH-101.

PHYSICS ASSIGNMENT. - XI

OSCILLATIONS.

1. Every oscillatory motion is necessarily periodic but every periodic motion need not be oscillatory justify.
2. How can earthquakes cause disaster sometimes
3. Two simple harmonic motions are represented by the equations
$$x_1 = 5 \sin(2\pi t + \pi/4) \quad x_2 = 5\sqrt{2} (\sin 2\pi t + \cos 2\pi t)$$

What is the ratio of their amplitudes?
4. The period of vibration of a mass m suspended by a spring is T . The spring is cut into n equal parts and the body is again suspended by one of the pieces. Find the time period of oscillation of the mass.
5. A simple harmonic motion has an amplitude A and time period T . What is the time taken to travel from $x=A$ to $x=A/2$.
6. A SHM is represented by $\frac{d^2x}{dt^2} + \alpha x = 0$. What is its time period?
7. The length of a simple pendulum executing SHM is increased by 21%. What is the percentage increase in the time period of the pendulum of increased length.

8. A spring of force constant k is cut into two pieces, such that one piece is double the length of the other, what is the force constant of the longer piece of the spring?

9. What fraction of the total energy is kinetic when the displacement of a simple harmonic oscillator is half of its amplitude?

10. Justify the following statements.

i) The motion of an artificial satellite around the earth cannot be taken as SHM.

ii) The time period of a simple pendulum will get doubled if its length is increased four times.