# 15 Lecture - PHY101

## Important Mcqs

**Which of the following is a necessary condition for simple harmonic motion?**

A) Force is directly proportional to velocity

B) Acceleration is directly proportional to position

C) Velocity is directly proportional to position

D) Acceleration is directly proportional to velocity

Answer: B) Acceleration is directly proportional to the position

**Which of the following is true for the displacement of a simple harmonic oscillator?**

A) It is directly proportional to the velocity of the oscillator.

B) It is directly proportional to the acceleration of the oscillator.

C) It is proportional to the square of the velocity of the oscillator.

D) It is proportional to the square of the acceleration of the oscillator.

Answer: B) It is directly proportional to the acceleration of the oscillator.

**A simple pendulum oscillates with a period T. If the length of the pendulum is doubled, what is the new period of oscillation**?

A) T/2

B) T

C) 2T

D) 4T

Answer: C) 2T

**The restoring force in a simple harmonic oscillator is given by F = -kx, where x is the displacement from equilibrium and k is the spring constant. What is the period of oscillation?**

A) T = 2?/k

B) T = ?/k

C) T = 2??(k/m)

D) T = ??(k/m)

Answer: D) T = ??(k/m)

**Which of the following quantities remains constant in simple harmonic motion?**

A) Amplitude

B) Frequency

C) Phase

D) Energy

Answer: D) Energy

**A mass attached to a spring oscillates with a period of 2 seconds. What is the frequency of oscillation?**

A) 1 Hz

B) 0.5 Hz

C) 2 Hz

D) 4 Hz

Answer: A) 1 Hz

**The amplitude of a simple harmonic oscillator is 0.2 m and its period is 5 seconds. What is the maximum velocity of the oscillator?**

A) 0.04 m/s

B) 0.2 m/s

C) 0.4 m/s

D) 1 m/s

Answer: C) 0.4 m/s

**The motion of a particle is described by the equation x = 3cos(2?t) where x is the displacement from equilibrium and t is time. What is the frequency of oscillation?**

A) 1 Hz

B) 2 Hz

C) 3 Hz

D) 4 Hz

Answer: B) 2 Hz

**The kinetic energy of a simple harmonic oscillator is maximum when the displacement is:**

A) At the equilibrium position

B) At the maximum displacement from the equilibrium

C) At the minimum displacement from equilibrium

D) The kinetic energy is the same at all points

Answer: A) At the equilibrium position

**The period of a simple pendulum of length L and mass m is given by T = 2??(L/g), where g is the acceleration due to gravity. If the length of the pendulum is doubled, what is the new period of oscillation?**

A) T

B) 2T

C) T/2

D) 4T

Answer: B) 2T