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## First semester | Physics (Sessional Mid solved by AI \*)

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### 1. Why the simple pendulum is called simple?

The simple pendulum is called "simple" because it consists of a mass (usually a bob) attached to a string or rod of fixed length, and its motion is simple and regular. The motion of a simple pendulum is primarily influenced by gravity and the length of the string, making it a straightforward system to study and analyze.

### 2. What is the effect of length of string on the period of a pendulum?

The period of a pendulum is the time it takes for one complete oscillation. The period of a simple pendulum is affected by the length of the string. The longer the string, the longer the period. This is because the longer the string, the more time it takes for the bob to swing through its full range of motion.

### 3. Why does simple pendulum stop?

A simple pendulum stops because of air resistance and friction at the pivot point. Air resistance slows down the bob as it swings, and friction at the pivot point causes the bob to lose energy. Eventually, the bob will stop swinging.

### 4. What are the uses of simple pendulum?

- Measuring time
- Detecting earthquakes
- Tuning musical instruments
- Studying the properties of gravity
- Analyzing the motion of other oscillating systems

### 5. What do you understand by latent heat of fusion of ice? Why ice has high latent heat of fusion?

The latent heat of fusion of ice is the amount of heat energy required to melt one unit mass of ice at its melting point (0 degrees Celsius). Ice has a high latent heat of fusion because it takes a lot of energy to break the strong bonds between the water molecules in ice. This is why it takes a long time to melt ice, even when it is placed in a warm environment.

### 6. How do you calculate latent heat of fusion? What are the three types of latent heat?

The latent heat of fusion can be calculated using the following formula:

$$L = m * \Delta H_f \text{ where:}$$

- L is the latent heat of fusion (in joules per kilogram)
- m is the mass of the ice (in kilograms)
- $\Delta H_f$  is the specific latent heat of fusion of ice (in joules per kilogram)

The specific latent heat of fusion of ice is 334 joules per kilogram.

The **three types of latent heat** are:

- Latent heat of fusion: The heat required to melt a solid.
- Latent heat of vaporization: The heat required to vaporize a liquid.
- Latent heat of sublimation: The heat required to convert a solid directly into a gas.

**7. What is sonometer? Which wave is used in sonometer?**

A sonometer is a device used to study the properties of waves, such as frequency, wavelength, and velocity. It consists of a long string stretched between two supports. A weight is attached to the end of the string, and the string is vibrated by plucking it or bowing it.

The waves that are produced on the string are transverse waves. This means that the particles of the string move perpendicular to the direction of the wave propagation. The frequency of the waves produced on the string is determined by the length of the string, the tension in the string, and the mass of the weight.

**8. Why is sonometer so called? What are the uses of sonometer?**

The sonometer is called a sonometer because it is used to study sound waves.

Sound waves are a type of mechanical wave that propagates through a medium, such as air or water. The sonometer can be used to create sound waves of different frequencies, and to study how these waves interact with different objects.

**9. Briefly explain the principle of sonometer?**

The principle of the sonometer is that the frequency of the waves produced on the string is inversely proportional to the length of the string. This means that the shorter the string, the higher the frequency of the waves. The frequency of the waves can also be affected by the tension in the string and the mass of the weight.

**10. What are nodes and antinodes? What is the distance between two consecutive nodes or antinodes?**

Nodes and antinodes are points on a standing wave where the displacement of the medium is zero and maximum, respectively. The distance between two consecutive nodes or antinodes is equal to half the wavelength of the wave.