

5

Pre-lab 6:

Your name: Mohammad Tawfiqul Haqan Riyad ID#: 2413692042

1. Distinguish between a simple pendulum and a compound pendulum.

A simple pendulum consists of a point mass (bob) suspended from a fixed support by a light string. The entire mass is assumed to be concentrated at a single point and the string has negligible mass and no rigidity.

On the other hand, a compound pendulum is a rigid structure, that is free to rotate about a horizontal axis. The mass g is distributed over its entire length, and its motion is influenced by the moment of inertia of the body about the axis of rotation.

2. What do you understand by moment of inertia and torque?

The moment of Inertia (I) of a body is a measure of its resistance to rotational motion about a given axis. It depends on the mass of object and how that mass of object and how that mass is distributed related to axis of rotation.

$$I = \sum m_i r_i^2$$

Torque: Torque is the rotational equivalent of force. It is the measure of the tendency of a force to rotate an object about an axis of pivot.

$$\tau = \bar{r} \times \bar{F} = r F \sin \theta; \quad r = \text{distance from axis to pivot}; \quad F = \text{Force}$$

$\theta = \text{angle between force and momentum}$