Exp.No. 3: The acceleration of free fall by means of the Simple pendulum

Theory:

The periodic time T of a simple pendulum L is given by:

$$T = 2\pi \times \sqrt{L/g}$$

Where, g is the acceleration of free fall. By squaring two sides

$$T^2 = 4\pi^2 (L/g)$$

The acceleration of free fall g is given

$$g = 4\pi^2 (L/T^2)$$

Draw a graph between L in y-axis and T^2 in x-axis, the slope of the straight line of the graph is equal to (L/T^2) with units of cm/s^2.

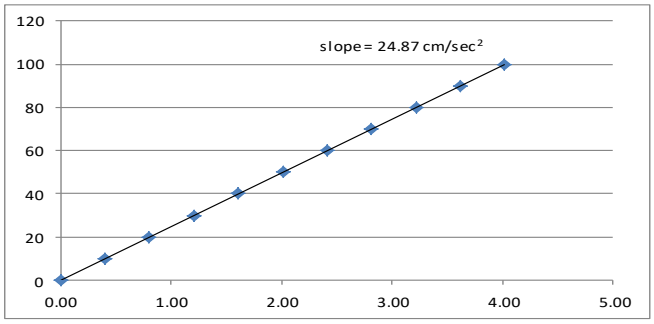
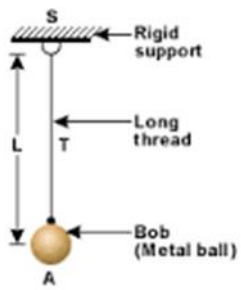
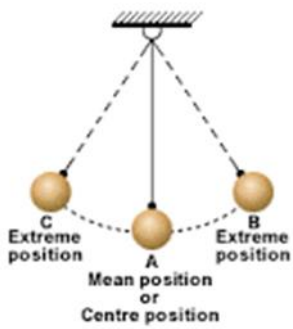
$$g = 4\pi^2 \times \text{slope}$$

Method:

1- Tie one meter length of thread to the pendulum bob.

3- Set the pendulum bob swinging through a small arc of about 10°. With a stopwatch measure the time for 10 complete oscillations. Repeat the timing and record both times.

4- Determine the length L (90 or 80 cm) of the cotton from the point of suspension to the point of attachment to the bob shorten the length of the pendulum by successive amounts of about 10 cm and for each new length take two observations of the time for (10) oscillations.

Tabulate your readings in the table below.

Length L cm	T1 sec for 10 oscillations	T2 sec for 10 oscillations	T ave	T for one oscillation =T ave/10	T^2 sec^2
40					
50					
60					
70					
80					
90					
100