Exp.No.4 : The acceleration due to gravity using U-Tube

Theory:

The periodic time T of any oscillating pendulum L is given by:

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

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

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

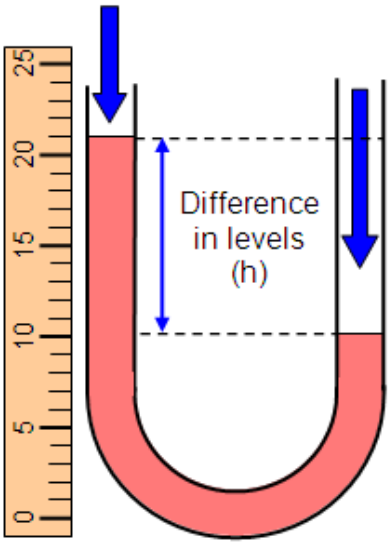
The acceleration of the gravity g is given

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

Method:

Pour water into the given U tube up to a height (L) say 20 cm. Incline the U tube and then close one end of the U tube by your finger .Raise it again and release. The water will vibrate(oscillate). Measure the time of 10 oscillations using a stop watch. Increase the water in the U tube by an amount say 5 cm and record the time of oscillation each time. Tabulate your readings in the table below.

Height of water L cm	T sec for 10 oscillations	T for one oscillation =T/10	T^2 sec^2
20			
25			
30			
35			
40			
45			



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. Then:

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