Theory: A simple pendulum consists of a mass "m" hanging on the end of light string of length “L”. When the mass is deflected from its equilibrium, it oscillates back and forth. The time for one complete oscillation is called the period time of the simple pendulum. For small angles of deflection the simple pendulum motion described by Simple harmonic motion. Simple Harmonic Motion is defined as a motion in which the restoring force is directly proportional to the displacement of the body from its equilibrium position (F= – k x). The direction of this restoring force is always towards the equilibrium position. The acceleration of a particle executing simple harmonic motion is given by: a (t) = – □2 x(t) Here, □ is the angular frequency of the particle. We can deduce that; □2 = □ □ so □ = √□ □ But □ = 2πf, where f is the frequency of the oscillation (Number of oscillations in one second). The frequency f is measured in cycles per/second (Hz) and the angular frequency is usually measured in radians per second. Using the definition of the angular frequency and the reciprocal relationship between period of time and frequency (f = 1/T), we can deduce: □ □ = 2□ √ □ □□□□. □2 = 4□2 □ □ According to the above relation you should note that, the time period of a simple pendulum depends on the length of the pendulum (L) and is completely independent of the mass of the pendulum bob. Then we can calculate the value of g through the following relation: □ = 4□2 (□ □2) m/s2