Name: Class:

Experiment 1: Simple Harmonic Motion

Read over the lab manual and then answer the following question.

a)   State the objective of the experiment.
      To determine the ...., g due to gravity using a simple pendulum and
      to investigate the effect of .... amplitude oscillation to the .... of g
      obtained from the experiment.

b)   Identify the variables of the experiment.

      Manipulated variable   :

      Responding variable   :

      Constant variable   :

c)   Theory:

      i)   An oscillation of a simple pendulum is a simple harmonic motion if:

            a)   The mass of the spherical bob is a ....

            b)   The mass of the string is ....

            c)   .... of the oscillation is small (........ 10°).

      ii)   According to the theory of SHM, the period of oscillation of a simple
            pendulum, T is given as:

            $$T = 2\pi \sqrt{\frac{l}{g}} \qquad\qquad T^2 = \frac{4\pi^2 l}{g}$$

d)   Procedures & Data Analysis:

      To determine the acceleration g due to gravity using a simple pendulum.

      i)   The pendulum should be released at less than .... from the ....
            plane. Then, measure the time for .... complete oscillations.

      ii)   How to calculate the period of oscillation, T of the pendulum?
            $$T = \frac{Average\ time\ for\ 20\ complete\ oscillations}{...........}$$

1

iii) What graph you need to plot for this part of the experiment?

Graph of ……… against ………… .

iv) How do you determine the acceleration, g due to gravity from the graph?

The gradient of the graph, m is equal to $\dfrac{4\pi^2}{}$. Hence, $g = \dfrac{4\pi^2}{}$.

v) What is the theoretical value of g?

……………… ms^{-2}.

To investigate the effect of large amplitude oscillation.

i) Fixed the length of the pendulum at ……….. cm. The pendulum should be released about ……..° from the vertical and measure the time for ……. complete oscillations.

ii) How do you calculate the acceleration, g due to gravity for this part of the experiment?
Using equation ……… and the value of l and T from step (f) of the experiment procedures.

iii) Between the values of g obtained from procedure (e) and procedure (f), which one do you think will be closer with the standard value of g?

The value of g obtained from procedure (e).

The value of g obtained from procedure (e).