Pre-Lab Report

Lab section:

Name & Surname:

Table # :

***Before the Lab** complete this page YOURSELF! Hand it in in the first 5 min. of the session PERSONALLY!*

You MUST justify your answers and show all steps. NO COPYCAT answers, or NO credits!

Please read the relevant presentation on PHYS LAB Website.

Q1. In this experiment, a simple pendulum is going to be studied. **Justify your answers, show calculations if needed or no credits!**

a. What are the possible sources of systematic errors in this experiment? Answer this question with respect to the classification in your book.

b. At what point of its swing, does the ball have its maximum velocity? Maximum acceleration?

c. Assume that your pendulum passes through its equilibrium point every second. What is the period of this pendulum? What must be the length of this pendulum?

(2nd Question is on the next page!)

Q2. Imagine that you are performing the simple pendulum experiment on the Moon. The data you collected is presented below:

L_1= 170,0 cm t_1= 20,41sec
L_2= 175,4 cm t_2= 20,75 sec
L_3= 182,3 cm t_3= 21,03 sec

where t_i is the period for 10 oscillations. Calculate the gravitational acceleration for each measured data and take the average of these 3 values.

Write what you have found for the average gravitational acceleration on the Moon to the box below with correct significant figures and units.

Show your calculations below explicitly or no credits!

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Complete this report YOURSELF except DATA taking parts! Use a pencil for plots only and a pen for the rest! **Show your work clearly, NO COPYCAT analysis allowed, or NO credits!**

OBJECTIVE : To study the motion of a simple pendulum and to determine the acceleration due to gravity using a simple pendulum.

THEORY : For small angular displacements less than about ten degrees, it can be shown that the motion of a point mass attached to the end of a string of length L is a periodic motion with the period:

$$T = 2\pi\sqrt{\frac{L}{g}}$$

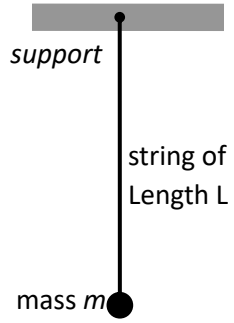
We can calculate the gravitational acceleration, g, if we measure the length of the string and the period of oscillations:

$$g = 4\pi^2 \frac{L}{T^2}$$

APPARATUS **:** A string of length L, a stopwatch, a metal ball and a meter stick.

PROCEDURE :

- Choose an initial length for the pendulum which should not be less than 120.0 cm.
- Set the pendulum into oscillation making sure that the maximum amplitude is less than ten degrees.



- Measure the time, t, for 10 complete oscillations using a chronometer and determine the period, T, corresponding to the chosen length. Use all the significant figures provided by your device.
- Repeat this for 4 more length values. Calculate g for each measurement.
- Take the average of 5 values you have calculated and compare it with the theoretical value.

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DATA-TAKING

Description	Symbol		Value & Unit
Acceleration due to gravity	g_{TV}	=	9.808 m/s^2
Number of Oscillations	N	=	10

Length of Pendulum ***L* ( )**	***10 periods*** ***t* ( )**	***One Period*** ***T* ( )**

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CALCULATIONS & RESULTS

Symbol		Calculations (show each step)	Result & Unit
g_1	=	.....	.....
g_2	=	.....	.....
g_3	=	.....	.....
g_4	=	.....	.....
g_5	=	.....	.....
$g_{average}$	=	.....	.....

% Deviation for *g*: ....

.....

Consult to the resources for this experiment from PHYS LAB Website:

PHYL101 Intro

Presentation #1

PHYL101 Lab Book