
Student Number

Assessment Task 1
Practical Examination

Year 12 Physics

General Instructions

- Reading time – 5 minutes.
- Working time – 60 minutes.
- Read through the instructions and plan what you will do before you start.
- Write using black or blue pen.
- Draw diagrams using pencil.
- Approved calculators may be used.
- Write your Student Number at the top of this page and on each page on which you have provided an answer.

Total Marks – 35

Part A – Practical Work and Report
25 marks

- Follow the instructions provided
- Answer this part in the spaces provided on this paper
- Allow about 30 minutes for this part

Part B - Questions
10 marks

- Attempt Questions 1
- Answer this part in the spaces provided on this paper
- Allow about 30 minutes for this part

PART A - 25 Marks

Write your report in the spaces provided.
Show all relevant working where calculations are performed.

Data

Acceleration due to gravity, g = 9.8 ms^{-2}

Period of a pendulum is given by, $T = 2\pi\sqrt{\frac{l}{g}}$

Where:

T = period of pendulum (s)
l = length of pendulum (m)
g = acceleration due to gravity (ms^{-2})

Displacement is given by, $s = ut + \frac{1}{2}at^2$

Where:

s = displacement (m)
u = initial velocity (ms^{-1})
t = time (s)
a = acceleration (ms^{-2})

Marks

Task

In this experiment you will measure and calculate the acceleration due to gravity by timing water drops hitting an aluminium tray.

Equipment

- Burette
- Burette clamp
- Retort stand
- Plastic funnel
- Beaker
- Pie dish
- Metre ruler
- Stopwatch
- Pencils

Investigation

2

1. Put a pie plate on the floor and set-up the burette so that the end of the burette is exactly one metre from the surface of the pie plate. You may need to support the plate on three or four pencils so that you can hear the drops distinctly.

2. Fill the burette with water until the water line is roughly level with the 50 mL mark.

Marks

3. Adjust the valve carefully until one drop strikes the plate exactly at the same instant that another drops leaves the burette. You can do this most easily by watching the drop leaving the burette while listening for the drops hitting the plate. When you have exactly set the valve, the time it takes for one drop to fall to the plate is equal to the time interval between one drop and the next.

4. Record the time it takes for 50 drops to travel the distance and record your result. Calculate the time for one drop.

5. Repeat the experiment three (3) times until you have the results for three (3) trials with which you are happy.

6. Calculate the acceleration due to gravity using the formula provided in the data section on the front page (assume that the initial velocity of the drop was zero).

Format of Report

1

You are required to hand in a scientific report that details your findings. It should include:

1

Aim

A statement of the aim of the experiment.

Materials

For this section just write "See attached sheet."

Method

For this section just write "See attached sheet."

Results

8

This section should include all of the data you collected presented in a table. It should also include any calculations you performed to arrive at your value for the acceleration due to gravity.

Discussion

In this section you should:

13

- Comment on the validity of this experiment. This should include an explanation of two ways in which it could be improved.
- Discuss the reliability of your results.
- Discuss the accuracy of your final result.

PART B - 20 Marks

Answer the questions in the spaces provided.

Marks

Question 1

A teacher performed an experiment with the same aim but used the period of a pendulum to calculate the acceleration due to gravity. The results of the experiment are shown in the table below.

Trial	Time for 10 Oscillations (s)	Period, T (s)	Length of Pendulum (m)	Period Squared, T^2 (s^2)
1	27.24	2.724	1.890	7.42
2	24.92	2.492	1.565	6.21
3	22.80	2.280	1.305	5.20
4	20.47	2.047	1.045	4.19
5	17.34	1.734	0.740	3.00
6	14.98	1.498	0.540	2.24

4

a) Using the graph paper provided, plot the period squared (t^2) on the y-axis and the length of the pendulum (l) on the x-axis. Draw a straight line of best fit on the graph.

2

b) Using the formula for the period of a pendulum and the gradient of the graph you have drawn, calculate the acceleration due to gravity.

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Marks

c) Compare the above experiment with your own experiment and evaluate which method is more valid.

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End of Paper