Cambridge IGCSE

Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER | CANDIDATE NUMBER

9354553539

PHYSICS **0625/52**

Paper 5 Practical Test **October/November 2019**

1 hour 15 minutes

Candidates answer on the Question Paper.

Additional Materials: As listed in the Confidential Instructions.

READ THESE INSTRUCTIONS FIRST

Write your centre number, candidate number and name in the spaces at the top of the page.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.
You are advised to spend about 20 minutes on each of questions 1 to 3, and about 15 minutes on question 4.
Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

For Examiner's Use	
1	
2	
3	
4	
Total	

This syllabus is regulated for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **9** printed pages and **3** blank pages.

1 In this experiment, you will investigate a pendulum. Carry out the following instructions, referring to Fig. 1.1 and Fig. 1.2.

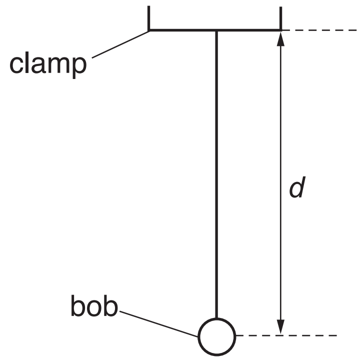


Fig. 1.1

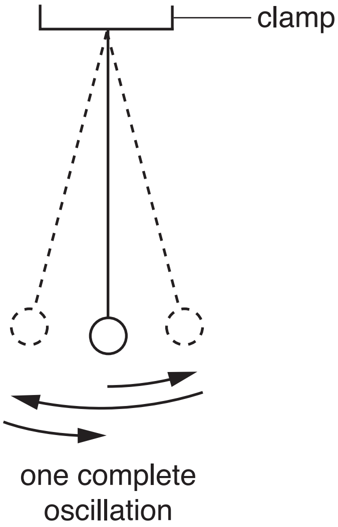


Fig. 1.2

A pendulum has been set up for you as shown in Fig. 1.1.

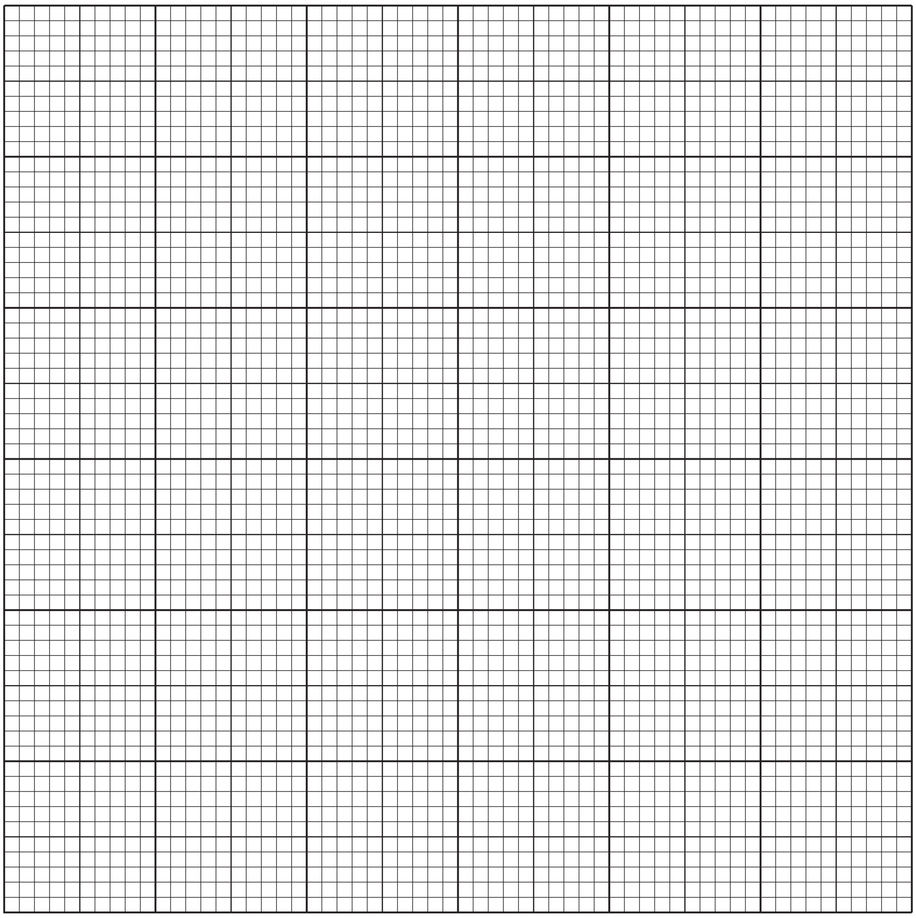
(a)
- Adjust the length of the pendulum until the distance d measured to the centre of the bob is 50.0 cm.
- Displace the bob slightly and release it so that it swings. Fig. 1.2 shows one complete oscillation of the pendulum.
- Measure, and record in Table 1.1, the time t for 20 complete oscillations.
- Calculate, and record in Table 1.1, the period T of the pendulum. The period is the time for one complete oscillation.
- Calculate T^2. Record its value in Table 1.1.
- Repeat the procedure using d = 60.0 cm, 70.0 cm, 80.0 cm and 100.0 cm.

Table 1.1

d/cm	t/s	T/s	T^2/s^2
50.0			
60.0			
70.0			
80.0			
100.0			

[4]

(b) Plot a graph of T^2/s^2 (y-axis) against d/cm (x-axis). You do **not** need to start your axes at the origin (0,0).



[4]

(c) Determine the gradient G of the line. Show clearly on the graph how you obtained the necessary information.

G = ... [1]

(d) Calculate the acceleration of free fall g in m/s^2 using the equation $g = \frac{0.395}{G}$, where G is your gradient from **(c)**.

Write down the value of g to a suitable number of significant figures for this experiment.

g = ...m/s^2 [2]

[Total: 11]

2 In this experiment, you will determine the resistance of a resistance wire.

Carry out the following instructions, referring to Fig. 2.1.

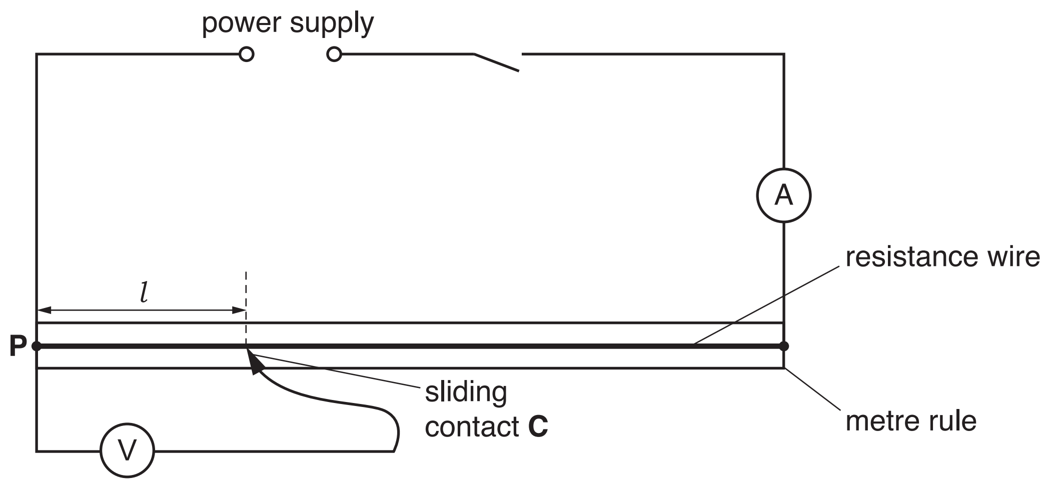


Fig. 2.1

(a) **(i)** Close switch.

Measure and record the current I in the circuit.

I = ... [2]

(ii)
- Place the sliding contact **C** at a distance l = 20.0 cm from **P**.
- Measure, and record in Table 2.1, the potential difference V across the length l of the resistance wire.
- Calculate, and record in Table 2.1, the resistance R of 20.0 cm of the resistance wire. Use the equation $R = \frac{V}{I}$.
- Repeat the procedure using l values of 40.0 cm, 60.0 cm, 80.0 cm and 100.0 cm.
- Open switch.

Table 2.1

l/cm	V/V	R/Ω
20.0		
40.0		
60.0		
80.0		
100.0		

[4]

(b) Look carefully at the values of l and R in Table 2.1.

(i) Tick **one** box to show your conclusion from the results.

☐ R is constant within the limits of experimental accuracy.

☐ R is directly proportional to l within the limits of experimental accuracy.

☐ R decreases as l increases.

☐ There is no simple relationship between R and l.

[1]

(ii) Justify your conclusion by reference to your results.

....

....

.... [1]

(c) **(i)** Use the values in Table 2.1 to estimate the potential difference V_e across 50.0 cm of the resistance wire.

V_e = ... [1]

(ii) Calculate the resistance of 50.0 cm of the resistance wire using the equation $R = \frac{V_e}{I}$.

Use the value of current I from part **(a)**. Give your answer to a suitable number of significant figures for this experiment and include the unit.

R = ... [2]

[Total: 11]

3 In this experiment, you will determine the focal length f of a lens.

Carry out the following instructions referring to Fig. 3.1.

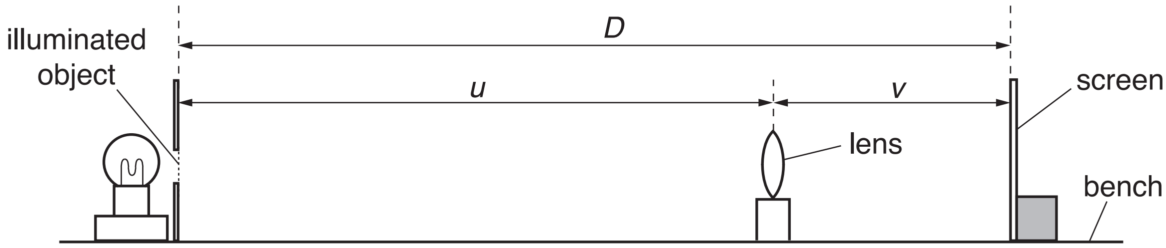


Fig. 3.1

(a)
- Place the screen a distance D = 80.0 cm from the illuminated object.
- Place the lens between the object and the screen so that the lens is very close to the screen.
- Move the lens slowly away from the screen until a clearly focused image is formed on the screen.

(i) Measure, and record in Table 3.1, the distance u between the centre of the lens and the illuminated object. [1]

(ii) Measure, and record in Table 3.1, the distance v between the centre of the lens and the screen. [1]

(iii) Calculate, and record in Table 3.1, the focal length f of the lens using the equation $f = \frac{uv}{D}$. [1]

(b) **Keep the screen at the distance D = 80.0 cm from the illuminated object.**

- Move the lens slowly away from the screen. The image will go out of focus.
- Continue to move the lens slowly further away from the screen until another clearly focused (and now magnified) image is formed on the screen.
- Measure, and record in Table 3.1, the distance u between the centre of the lens and the illuminated object.
- Measure, and record in Table 3.1, the distance v between the centre of the lens and the screen.
- Calculate, and record in Table 3.1, the focal length f of the lens using the equation $f = \frac{uv}{D}$.

[2]

Table 3.1

u / cm	v / cm	f / cm

(c) Calculate the average value f_A of the focal length of the lens. Give your answer to a suitable number of significant figures for this experiment.

f_A = ... cm [2]

(d) State **one** precaution that you would take to obtain accurate readings in this experiment.

....

.... [1]

(e) Another student wants to obtain more measurements for u and for v to check the value for the focal length f of this lens. The student moves the screen a distance of 40.0 cm to the right.

(i) Calculate the new value for the distance D between the illuminated object and the screen.

D = ... cm [1]

(ii) The student moves the lens to a new position which is a distance from the object u = 22.2 cm. He observes the image on the screen and says it is clearly focussed at a distance v = 97.9 cm.

Calculate the new value of the focal length f of the lens using $f = \frac{uv}{D}$.

f = ... cm [1]

(iii) State and explain briefly whether the values for f_A and f in **(e)(ii)** are the same within the limits of experimental accuracy.

....

....

.... [1]

[Total: 11]

4 A student investigates the time taken for ice cubes in a container to melt using different insulating materials on the container.

The following apparatus is available:

a copper container
a variety of insulating materials that can be wrapped around the copper container
a thermometer
a stopwatch
a supply of ice cubes

The student can also use other apparatus and materials that are usually available in a school laboratory.

Plan an experiment to investigate the time taken for ice cubes to melt using different insulating materials.

You are **not** required to carry out this investigation.

In your plan, you should:

- draw a diagram of the apparatus used
- explain briefly how you would carry out the investigation
- state the key variables that you would control
- draw a table, or tables, with column headings, to show how you would display your readings (you are **not** required to enter any readings in the table)
- explain how you would use your readings to reach a conclusion.

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[Total: 7]

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