Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

2425534166

PHYSICS **0625/52**

Paper 5 Practical Test **October/November 2023**

1 hour 15 minutes

You must answer on the question paper.

You will need: The materials and apparatus listed in the confidential instructions

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- You should show all your working and use appropriate units.

INFORMATION

- The total mark for this paper is 40.
- The number of marks for each question or part question is shown in brackets [ ].

For Examiner's Use	
1	
2	
3	
4	
Total	

This document has **12** pages. Any blank pages are indicated.

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[Turn over

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1 In this experiment, you will investigate the period of a pendulum.

Complete the following instructions, referring to Fig. 1.1 and Fig. 1.2.

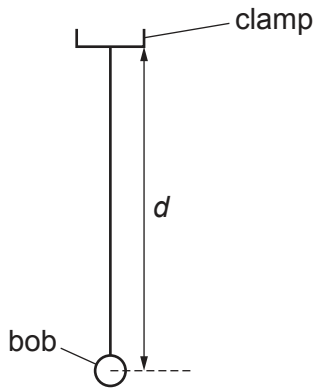

Fig. 1.1

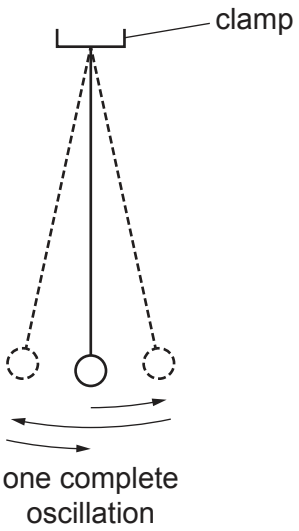

Fig. 1.2

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

(a) The distance *d* is measured from the bottom of the clamp to the centre of the bob.

- Adjust the length of the pendulum until $d = 50.0\,\text{cm}$.
- 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 10 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 and record the value in Table 1.1.
- Write the unit for T^2 in the column heading.

[3]

Table 1.1

d/cm	t/s	T/s	T^2/
50.0			
100.0			

(b) Repeat the procedure in **(a)** using $d = 100.0\,\text{cm}$. [3]

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(c) A student suggests that T^2 is directly proportional to d.

Explain briefly how to test the suggestion using the results in Table 1.1.

.....

..... [2]

(d) Describe how you measure the distance d as accurately as possible. Draw a diagram to help your explanation.

.....

..... [2]

(e) Explain why timing 10 oscillations gives a more accurate result for the period T than timing one oscillation.

.....

..... [1]

[Total: 11]

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

Complete the following instructions, referring to Fig. 2.1.

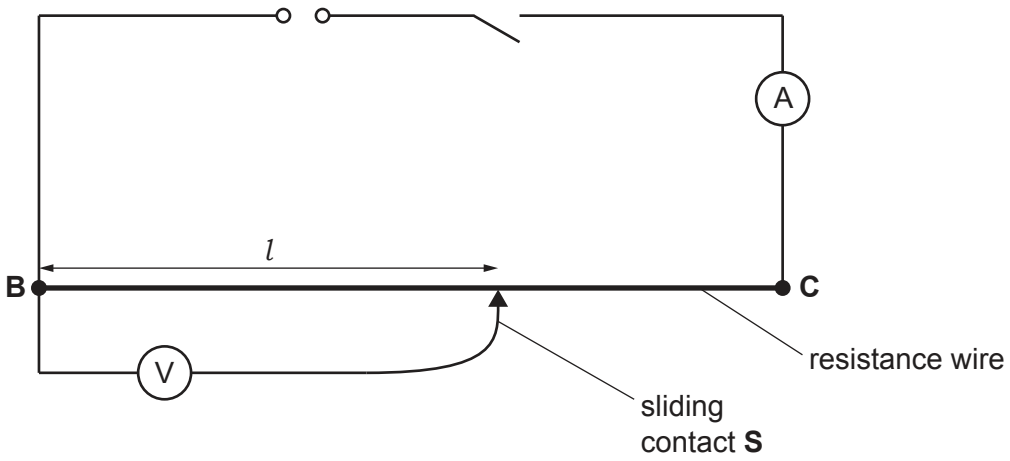

Fig. 2.1

(a) Close the switch.

Measure the current I in the circuit. I = ... [1]

(b) Place the sliding contact at a distance l = 10.0 cm from **B**.

Measure, and record in Table 2.1, the potential difference (p.d.) V across the length l of resistance wire **BC**.

Open the switch.

Calculate, and record in Table 2.1, the resistance R of 10.0 cm of the resistance wire using the equation

$$R = \frac{V}{I}$$

where I is the current recorded in **(a)**.

Close the switch.

Repeat the procedure using l = 20.0 cm, 30.0 cm, 40.0 cm and 50.0 cm.

Open the switch.

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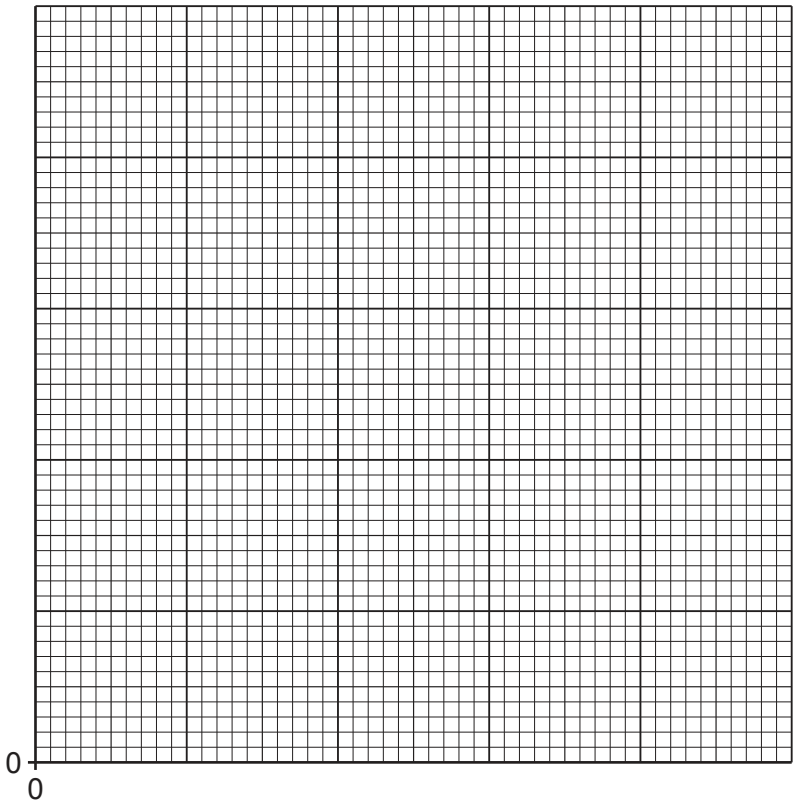
Table 2.1

l / cm	V / V	R / Ω
10.0		
20.0		
30.0		
40.0		
50.0		

[4]

(c) Plot a graph of R / Ω (y-axis) against V / V (x-axis). Start both axes at the origin (0,0).

Draw the best-fit line.



[4]

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

G = ... [2]

[Total: 11]

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3 In this experiment, you will investigate the cooling of hot water.

Complete the following instructions, referring to Fig. 3.1.

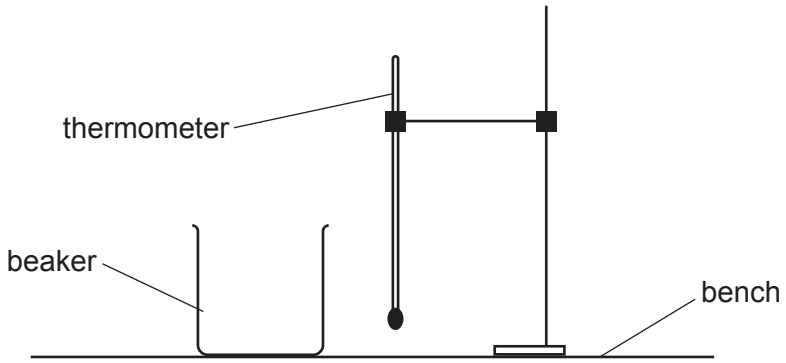

Fig. 3.1

(a) Use the thermometer to measure the room temperature θ_R.

θ_R = ... [1]

(b) **(i)** Pour 200 cm^3 of hot water into the beaker. Place the thermometer in the water in the beaker.

Record in Table 3.1 the temperature θ of the hot water at time t = 0. Immediately start the stop-watch.

Continue recording the temperature and the time in Table 3.1 at 30 s intervals until you have seven sets of readings. [2]

(ii) Complete the column headings in Table 3.1.

Table 3.1

t/	θ/

[1]

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(c) **(i)** Calculate the decrease in temperature $\Delta\theta_1$ between time t = 0 and time t = 90 s.

$\Delta\theta_1$ = ... [1]

(ii) Calculate the difference in temperature $\Delta\theta_S$ between the temperature at time t = 0 and room temperature θ_R.

$\Delta\theta_S$ = ... [1]

(iii) Calculate the decrease in temperature $\Delta\theta_2$ between time t = 90 s and time t = 180 s.

$\Delta\theta_2$ = ...

Calculate the difference in temperature $\Delta\theta_T$ between the temperature at time t = 90 s and room temperature θ_R.

$\Delta\theta_T$ = ...
[1]

(d) A student suggests that the decrease in temperature of the water in 90 s should be greater when the starting temperature is greater.

(i) State whether your results agree with this suggestion. Justify your statement by reference to your results.

statement .....

justification .....

.....

.....
[2]

(ii) Suggest how you would continue the experiment, using the same apparatus and method, to investigate the suggestion.

.....

.....

.....

..... [2]

[Total: 11]

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4 A student investigates the effect of changing the colour of light on the focal length of a lens.

The focal length f of a lens is given by the equation $f = \frac{uv}{(u + v)}$.

The distance u is the distance between an object and the lens. The distance v is the distance between the lens and the image that is formed on a screen.

Plan an experiment to investigate the effect of changing the colour of light on the focal length of a lens.

You are **not** required to do this experiment.

The following apparatus is available to the student:

- illuminated object
- a selection of coloured filters to change the colour of the light
- converging lens
- screen
- metre ruler.

Other apparatus normally available in a school laboratory can also be used.

In your plan, you should:

- draw a labelled diagram to show the arrangement of the apparatus
- explain briefly how you would do the investigation, including the measurements you would take
- draw a suitable table, with column headings, to show how you would display your readings (you are **not** required to enter any readings in the table)
- state how you would use your results to reach a conclusion.

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