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Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME

CENTRE NUMBER | | | | | |

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4247639916

PHYSICS **0625/51**

Paper 5 Practical Test **October/November 2024**

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.

[Turn over

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

Refer to Fig. 1.1 and Fig. 1.2.

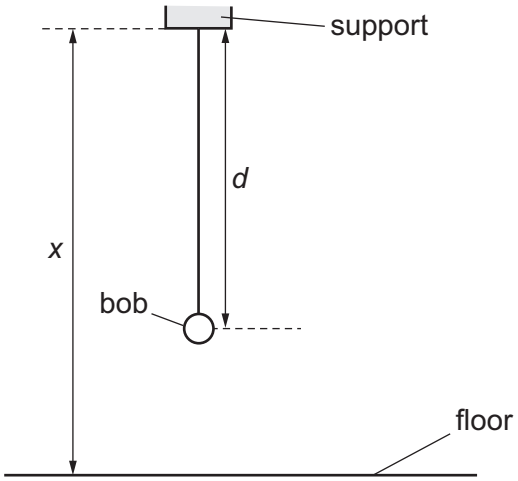

Fig. 1.1

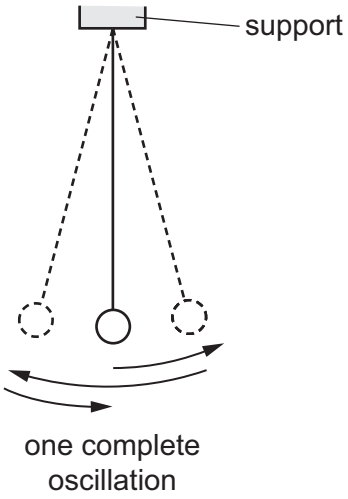

Fig. 1.2

A pendulum has been set up for you as shown in Fig. 1.1. Do **not** change the height of the support.

(a)
- Adjust the length of the pendulum until the distance d measured from the bottom of the support to the centre of the bob is 90.0 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 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 in Table 1.1. [2]

Table 1.1

d / cm	t / s	T / s	T^2 / s^2
90.0			
45.0			

(b) Repeat the procedure in **(a)** using a distance d = 45.0 cm. [3]

(c) Explain why timing 10 oscillations gives a more accurate result for the period T than timing 1 oscillation.

.....

..... [1]

(d) Describe **one** technique that you use to improve accuracy when measuring the distance *d*.

You may draw a diagram to help your description.

.....

..... [1]

(e) Describe **one** technique that you use to improve accuracy when measuring the time *t* for 10 oscillations.

.....

.....

..... [1]

(f) Measure the distance *x* between the bottom of the support and the floor. Give your answer to the nearest cm.

x = ... cm [1]

(g) A student plans to plot a graph of T^2 against *d*. Suggest suitable values of *d* that the student can use to obtain measurements that are sufficient for this task.

.....

..... [2]

[Total: 11]

2 In this experiment, you will investigate the cooling of water in a metal can.

Refer to Fig. 2.1.

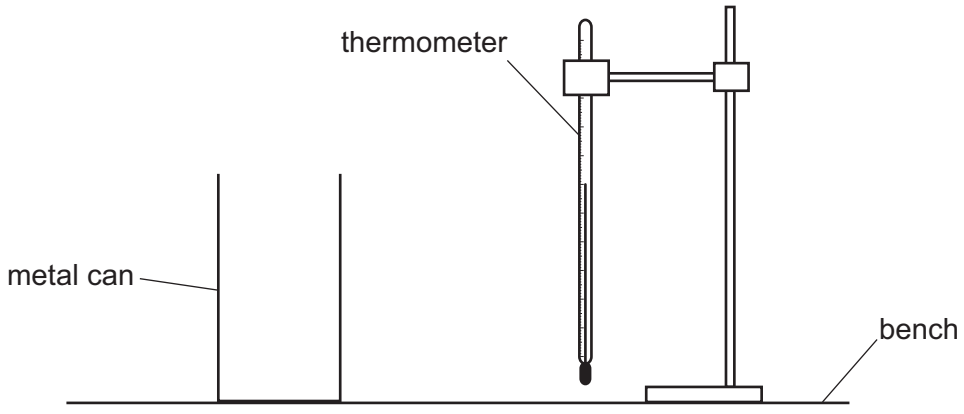

Fig. 2.1

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

θ_R = ... [1]

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

Record in Table 2.1 the temperature θ of the hot water at time t = 0. Immediately start the stop-watch.

Continue recording the temperature in Table 2.1 at 30 s intervals until you have seven sets of readings. [2]

(ii) Complete the column headings in Table 2.1.

Table 2.1

t/	θ/
0	
0.5	
1.0	
1.5	
2.0	
2.5	
3.0	

[1]

(c) Plot a graph of temperature θ (y-axis) against time t (x-axis). Label your axes appropriately.

You do not need to start the y-axis at 0. Draw the best-fit curve.

[4]

(d) A student states that the average rate of cooling of the water decreases as the temperature of the water approaches room temperature.

State whether your graph line supports this suggestion. Explain your answer by reference to the shape of the graph line.

statement .....

.....

explanation .....

.....

..... [2]

(e) Explain why it is good practice to read the thermometer scale at right angles to the reading.

.....

..... [1]

[Total: 11]

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3 In this experiment, you will investigate the image produced by a lens.

Refer to Fig. 3.1 and Fig. 3.2.

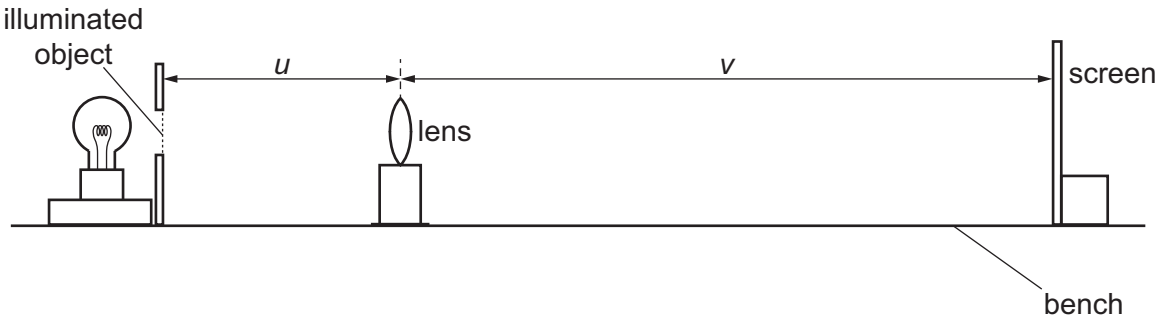

Fig. 3.1 (not to scale)

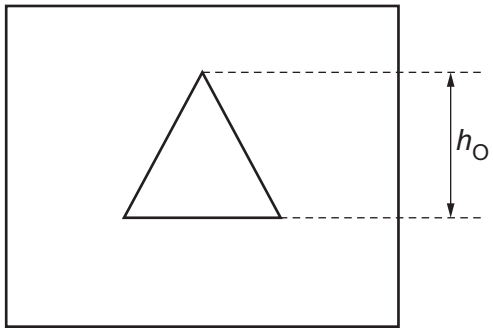

Fig. 3.2 (not to scale)

(a) Measure the height h_O of the illuminated object in your experiment. (Fig. 3.2 shows the height to be measured on your illuminated object.)

h_O = ... [2]

(b)
- Place the lens a distance u = 25.0 cm from the illuminated object.
- Move the screen slowly until a clearly focused image is formed on the screen.
- Measure the distance v between the centre of the lens and the screen.

v = ... cm [1]

(c) Calculate the focal length f of the lens using the equation $f = \frac{uv}{(u+v)}$

Give your answer to **three** significant figures and include the unit.

f = ... [3]

(d) The object is brighter than the image. Complete the sentences to describe **two** other ways in which the image seen on the screen is different from the object.

1. The image is .....

2. The image is .....

[2]

(e) Repeat the steps in **(b)** and **(c)** using a distance $u = 30.0\,\text{cm}$.

$v =$ ..... cm

$f =$ .....

[2]

(f) State and explain whether your results in **(c)** and **(e)** for the focal length f are equal within the limits of experimental accuracy.

.....

.....

..... [1]

[Total: 11]

4 A student investigates the current required to melt different fuse wires.

Fig. 4.1 shows part of the circuit the student uses.

The following equipment is also available:

- fuse wires with a selection of different diameters and metals (all with the same length)
- metre ruler
- ammeter
- variable resistor.

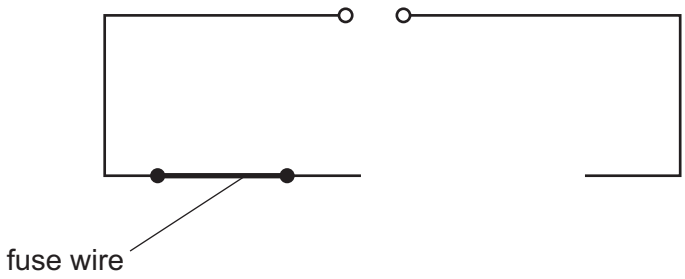

Fig. 4.1

Plan an experiment to investigate how **one** factor affects the current required to melt a fuse wire.

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

You do **not** need to write about safety precautions.

In your plan:

- state the variable that you choose to investigate
- complete the circuit diagram on Fig. 4.1
- explain briefly how to do the investigation
- state **one** key variable to keep constant
- draw a table, or tables, with column headings, to display the readings (you are **not** required to enter any readings in the table)
- explain how to use your results to reach a conclusion.

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DO NOT WRITE IN THIS MARGIN

[7]

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