Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME	

CENTRE NUMBER						CANDIDATE NUMBER				

0123456789

PHYSICS **0625/05**

Paper 5 Practical Test **For examination from 2023**

SPECIMEN PAPER **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 **14** pages. Any blank pages are indicated.

1 In this experiment, you will investigate how partly covering the top of a beaker of water affects the rate at which the water cools.

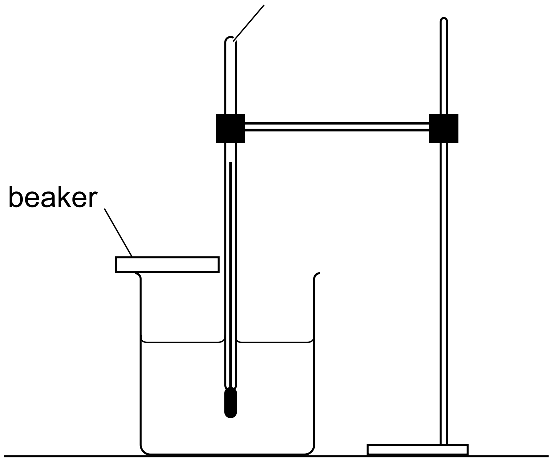

Fig. 1.1

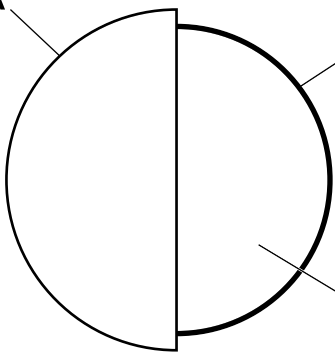

Fig. 1.2

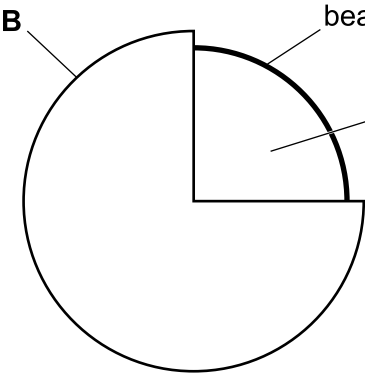

Fig. 1.3

(a) Refer to Fig. 1.1 and Fig. 1.2.

Instructions

- Pour 100 cm^3 of hot water into the beaker and cover half of it with lid **A** as shown in Fig. 1.2. This leaves 50% of the top of the beaker uncovered.
- Place the thermometer into the hot water and record, in the first row of Table 1.1, the temperature θ of the water at time t = 0. Immediately start the stopwatch.
- In Table 1.1, record the temperature θ of the water at times t = 30 s, t = 60 s, t = 90 s, t = 120 s, t = 150 s and t = 180 s.
- Pour the water out of the beaker.

[1]

(b) **(i)** Repeat **(a)**, using lid **B** instead of lid **A** to cover more of the beaker as shown in Fig. 1.3. This leaves only 25% of the top of the beaker uncovered. [2]

(ii) Complete the headings in Table 1.1. [1]

Table 1.1

	beaker with lid **A**	beaker with lid **B**
t /	θ /	θ / ....
0		
30		
60		
90		
120		
150		
180		

(c) **(i)** Write a conclusion to this experiment, stating for which lid the cooling rate is greater. Justify your answer with reference to your results.

....

....

....

.... [2]

(ii) Suggest a change to the **apparatus** that produces a greater difference between the rates of cooling for lid **A** and lid **B**. Explain why the change produces a greater difference.

change ....

....

explanation ....

....

[2]

(d) A student thinks that the cooling rate is directly proportional to the percentage of the surface area uncovered. He draws a graph of cooling rate against the percentage of uncovered area to investigate this.

Describe how his graph line shows whether the cooling rate and the percentage of surface area uncovered are directly proportional.

....

....

.... [2]

(e) Students in another country are doing the same experiment.

State **one** factor they must keep the same to obtain similar readings.

....

.... [1]

[Total: 11]

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2 In this experiment, you will investigate a resistance wire. The circuit has been set up for you.

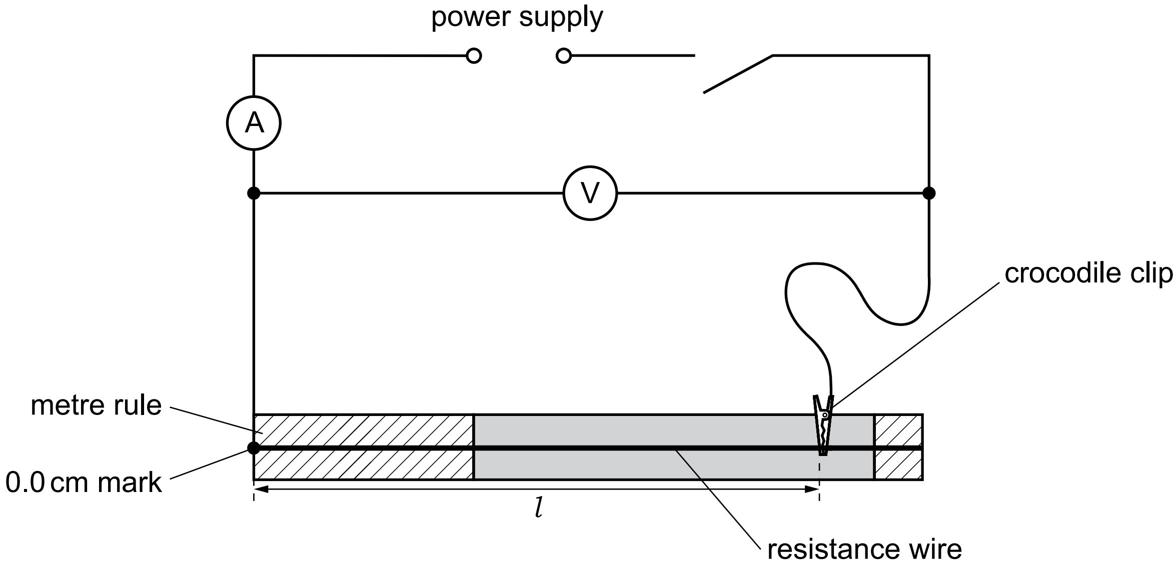

Fig. 2.1

(a) Refer to Fig. 2.1.

Instructions

- Connect the crocodile clip to a length l = 90.0 cm of the resistance wire.
- Switch on the power supply.
- In Table 2.1, record the value of the potential difference (p.d.) V and the current I for the wire.
- Switch off the power supply.
- Move the crocodile clip and repeat the procedure for lengths of resistance wire l = 60.0 cm and l = 40.0 cm.

[3]

(b) Complete the column headings in Table 2.1.

Table 2.1

l / cm	V /	I /	R / Ω	$\frac{R}{l}$ / $\frac{\Omega}{\text{cm}}$
90.0				
60.0				
40.0				

[1]

(c) **(i)** Calculate, and record in Table 2.1, the resistance R of each length l of the wire.

Use your readings from the table and the equation $R = \frac{V}{I}$.

[2]

(ii) Calculate, and record in Table 2.1, the value of $\frac{R}{l}$ for each length l of the wire.

[1]

(d) A student suggests that the values of $\frac{R}{l}$ for each length of wire should be the same.

State whether your results support this suggestion.

Justify your statement with reference to values from your results.

statement ....

justification ....

....

....

[1]

(e) Other students do the experiment carefully with the same equipment and do **not** obtain identical results.

Suggest **one** difficulty with the procedure to explain this difference in results.

....

....

.... [1]

(f) A student finds that during the experiment, the wire becomes hot because there is a high current.

She decides to use a variable resistor to prevent this.

(i) Draw an **X** on the circuit in Fig. 2.1, to show where a variable resistor is connected for this purpose in the experiment.

You are **not** required to do this experiment. [1]

(ii) In the space below, sketch the circuit symbol for a variable resistor.

[1]

[Total: 11]

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

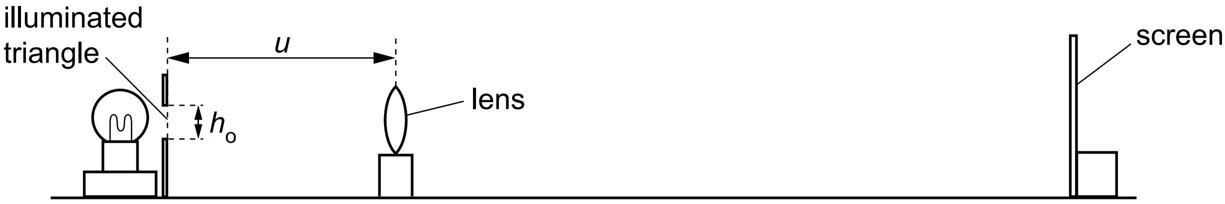


Fig. 3.1

(a) Refer to Fig. 3.1.

Instructions

- Measure and record the height h_O of the triangular object.

h_O = ...

- Switch on the lamp.
- Set the distance between the illuminated triangle and the lens to u = 30.0 cm.
- Move the screen until a clear focused image of the illuminated triangle is seen.
- Measure, and record in Table 3.1, the height h_I of the image.
- Repeat the procedure for u = 35.0 cm, u = 40.0 cm, u = 45.0 cm and u = 50.0 cm.
- Switch off the lamp.

Table 3.1

u / cm	h_I / cm	M
30.0		
35.0		
40.0		
45.0		
50.0		

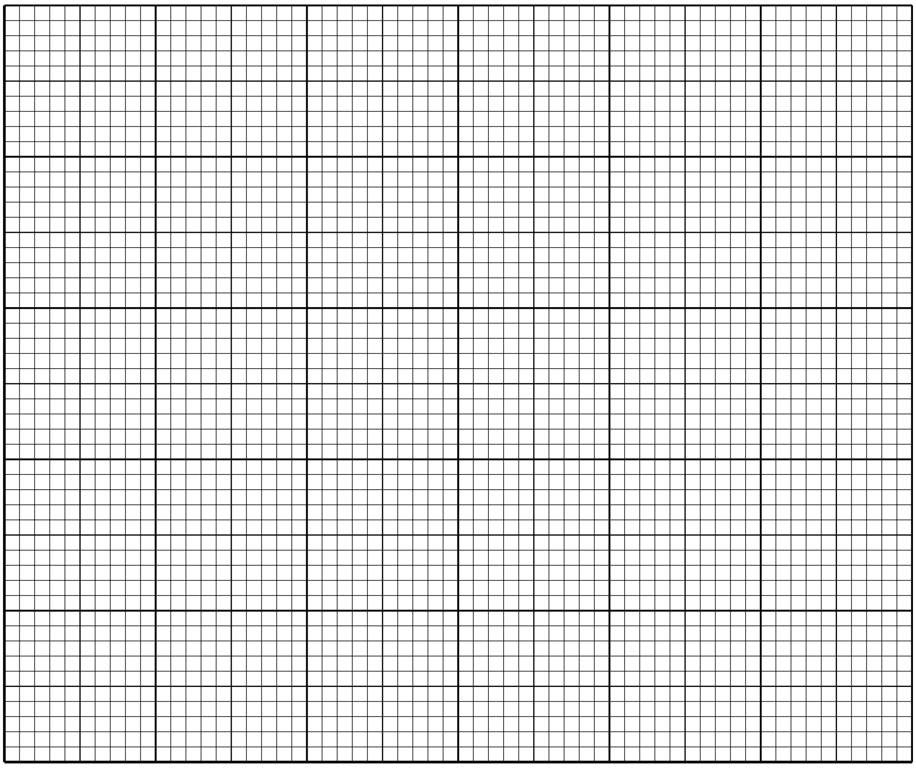
[2]

(b) For each distance u, calculate, and record in Table 3.1, a value M using your results from **(a)** and the equation $M = \frac{h_O}{h_I}$.

[1]

(c) Plot a graph of u / cm (y-axis) against M (x-axis).

You do **not** have to start your axes at the origin (0, 0).



[4]

(d) Determine the gradient G of the graph.

Show clearly on the graph how you obtained the necessary information.

G = ... [2]

(e) Describe **one** difficulty that might be experienced when measuring the height of the image h_I.

Suggest an improvement to the **apparatus** to reduce this difficulty.

difficulty ....

....

improvement ....

....

[2]

[Total: 11]

4 A student is investigating the factors that affect the size of the crater (hole) a ball makes when it is dropped into sand.

Plan an experiment to investigate **one** factor that affects the size of the crater. You are **not** required to do the experiment.

The apparatus available includes:

metal balls of different sizes
a tray of dry sand.

Write a plan for the experiment.

In your plan, you should:

- state which factor is being investigated
- state a key variable to keep constant
- list any additional apparatus needed
- explain briefly how to do the experiment, including what is measured and how this is done
- state how to obtain reliable results for this experiment
- suggest a suitable graph to be drawn from the results.

You may draw a diagram if it helps to explain your plan.

.... [7]

[Total: 7]

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