Cambridge IGCSE

Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

1574295149

PHYSICS **0625/52**

Paper 5 Practical Test **February/March 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 or graphs.
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	

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This document consists of **12** printed pages.

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[Turn over

1 In this experiment, you will investigate the reflection of light by a plane mirror.

Carry out the following instructions, using the separate ray-trace sheet provided.
You may refer to Fig. 1.1 for guidance.

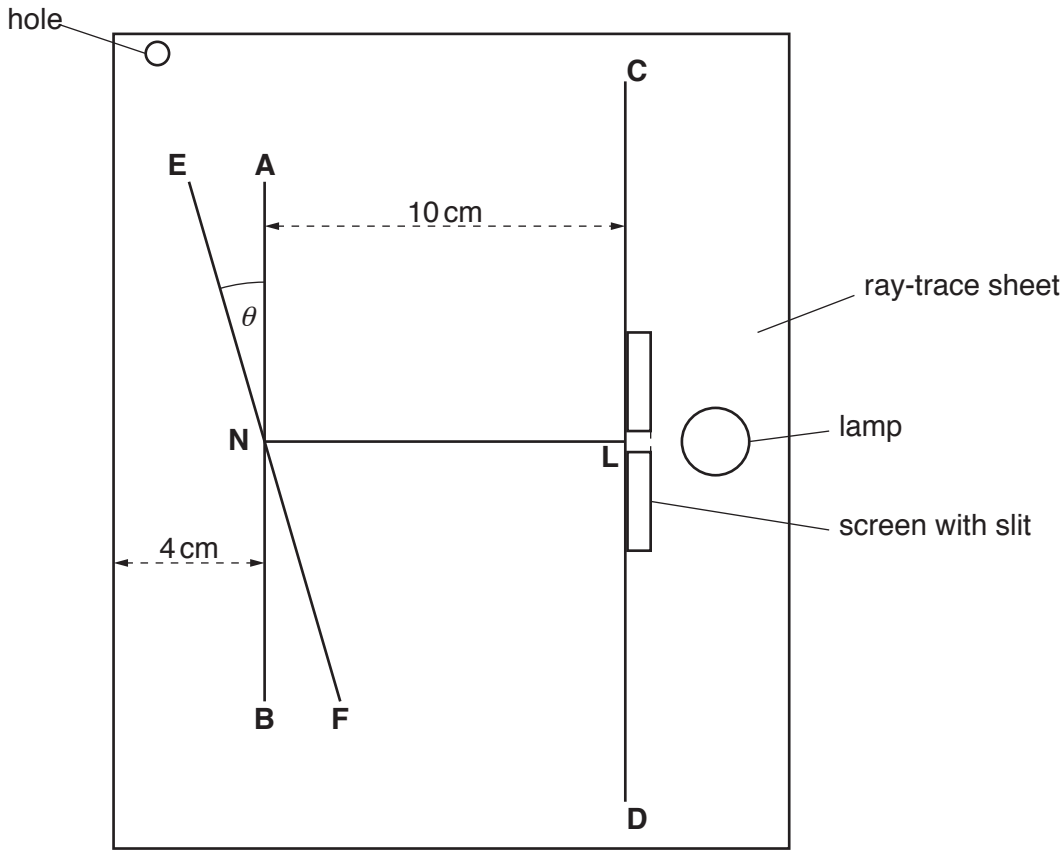


Fig. 1.1

(a)
- Draw a line **AB** 4 cm from the edge of the ray-trace sheet and in the middle of the paper, as shown in Fig. 1.1.
- Draw a line **CD** parallel to line **AB** and 10 cm from it.
- Draw a normal to line **AB** at a point **N** in the centre of line **AB**. Point **N** must be an equal distance from the top and bottom of the sheet.
- Extend the normal to line **CD** and label the point at which it crosses line **CD** with the letter **L**.

[1]

(b) Draw a line **EF**, through point **N**, as shown in Fig. 1.1 and at an angle $\theta = 5°$. [1]

(c)
- Place the plane mirror on line **EF** with the reflecting surface facing to the right.
- Place the screen with a slit on line **CD** and arrange the lamp so a ray of light shines along line **LN**.
- Mark the ray that is reflected from the mirror, using a small cross at a suitable distance from point **N**. Label this cross **G**.
- Remove the mirror, screen and lamp from the ray-trace sheet.

[1]

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(d)
- Draw a line joining point **N** and point **G**. Extend this line until it meets line **CD**.
- Label the point at which line **NG** meets line **CD** with the letter **H**.
- Measure, and record in Table 1.1, the length *a* of line **LH**.

[1]

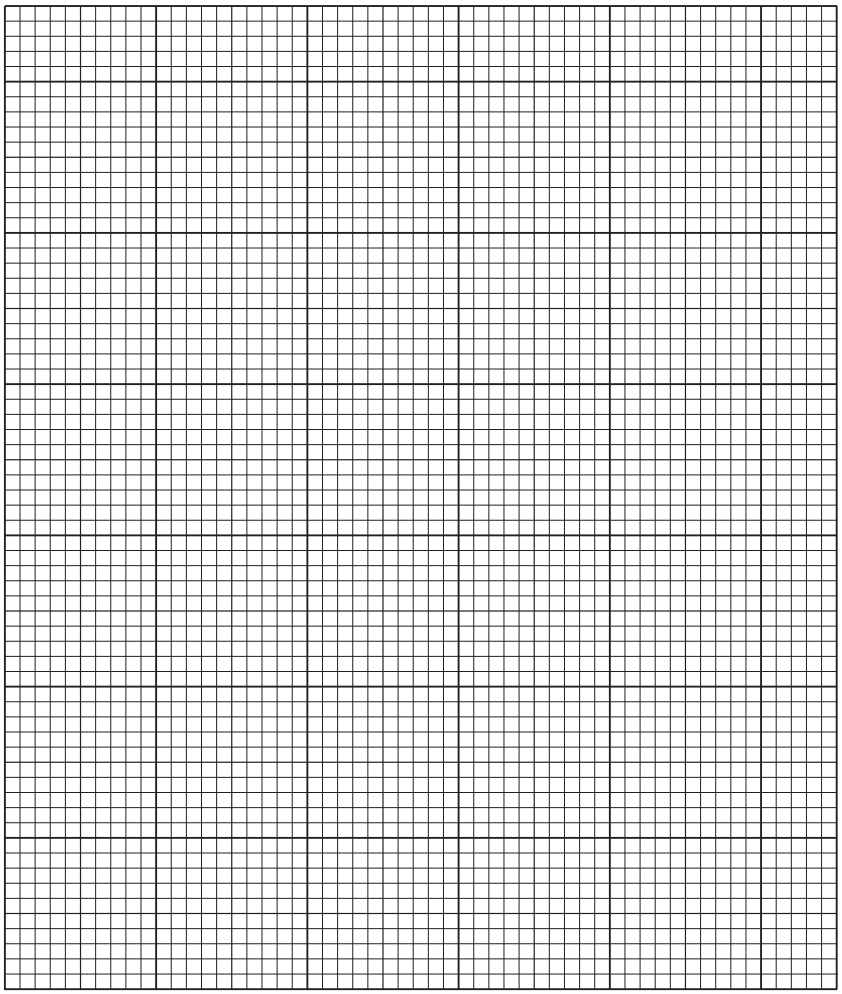
(e) Repeat **(b)**, **(c)** and **(d)** for values of $\theta = 10°$, 15°, 20° and 25°.

Table 1.1

θ/°	*a*/cm
5	
10	
15	
20	
25	

[1]

(f) Plot a graph of *a*/cm (*y*-axis) against θ/° (*x*-axis).



[4]

(g) Suggest a possible source of inaccuracy in this experiment, even if it is carried out carefully.

.....

..... [1]

(h) A student wishes to check if his values for *a* are reliable.

Suggest how he could extend the experiment, using the same apparatus, to check the reliability of his results.

You are **not** required to carry out this extended experiment.

.....

.....

..... [1]

[Total: 11]

Tie your ray-trace sheet into this question paper between pages 2 and 3.

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2 In this experiment, you will investigate how the use of a lid or insulation affects the rate of cooling of hot water in a beaker.

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

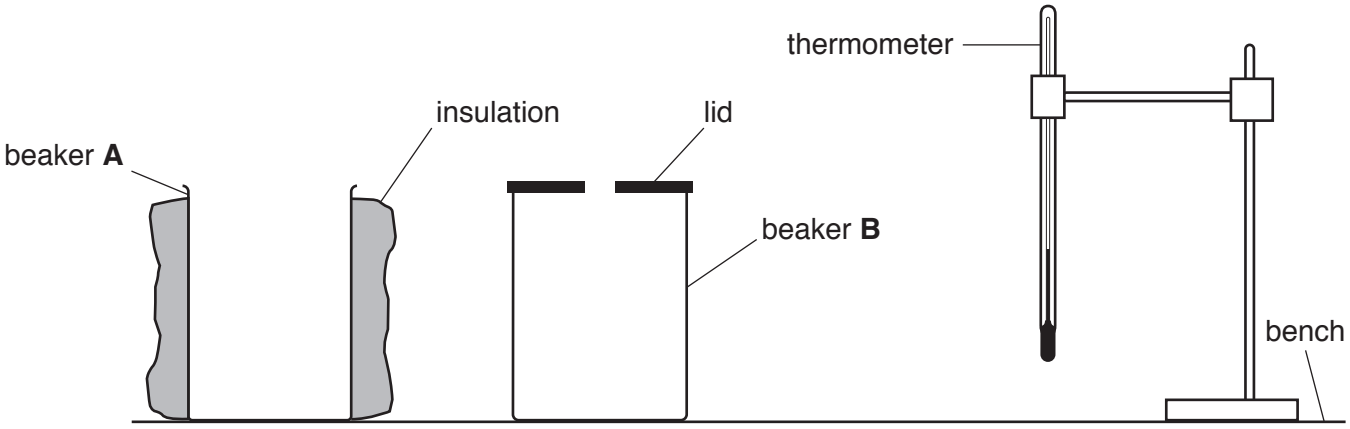


Fig. 2.1

(a) The thermometer must remain in the clamp throughout the experiment.

- Use the measuring cylinder to pour 100 cm^3 of hot water into beaker **A**.
- Place the thermometer in the water in beaker **A**.
- In the first row of Table 2.1, record the temperature θ of the water at time $t = 0$ and immediately start the stopclock.
- Record, in Table 2.1, the temperature θ of the water at times $t = 30$ s, 60 s, 90 s, 120 s, 150 s and 180 s.
- Remove the thermometer from the beaker. [1]

(b) (i) Repeat **(a)** for beaker **B**. Ensure that the lid is removed before pouring the hot water into the beaker. Replace the lid immediately after pouring. [2]

(ii) Complete the headings and the time column in the table. [2]

Table 2.1

	beaker **A** with insulation only	beaker **B** with a lid only
t /	θ/	θ/
0		

(c) Write a conclusion stating whether the insulation or the lid is more effective in reducing the cooling rate of the water in the beakers in this experiment.

Justify your answer by reference to your results.

.....

.....

.....

..... [2]

(d) A student thinks that the experiment does not show how effective insulation is on its own or how effective a lid is on its own.

Suggest an additional experiment which could be used to show how effective a lid or insulation is on its own.

Explain how the additional results could be used.

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

additional experiment .....

.....

.....

explanation .....

.....

.....
[2]

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(e) Students in another school are carrying out this experiment using equipment which is identical to yours.

State whether it is important for the students to make the initial temperature of the water the same as yours if they are to obtain average cooling rates that are the same as yours. Assume that the room temperature is the same in each case.

Use values from your results for beaker **A** in Table 2.1 to justify if this factor should be controlled.

statement .....

.....

explanation .....

.....

.....

[2]

[Total: 11]

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

Carry out the following instructions, referring to Fig. 3.1.

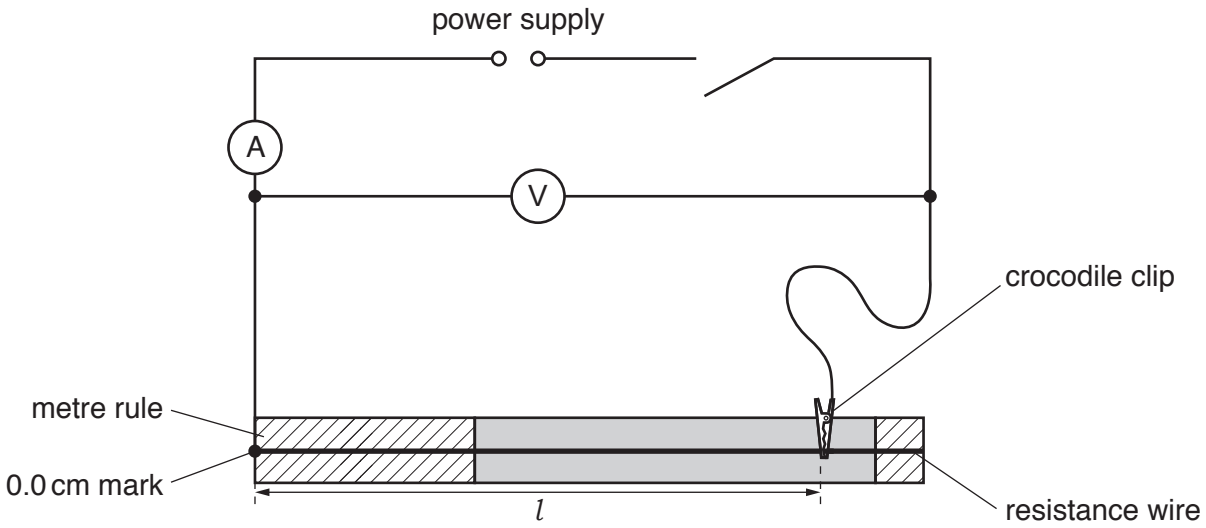


Fig. 3.1

(a)
- Connect the crocodile clip to a length l = 90.0 cm of the resistance wire.
- Switch on.
- Record, in Table 3.1, the value of potential difference (p.d.) V and current I for the wire.
- Switch off.
- Move the crocodile clip and repeat the procedure for lengths of resistance wire l = 60.0 cm and l = 40.0 cm.

[3]

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(b) Complete the column headings in Table 3.1. [1]

Table 3.1

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

(c) **(i)** Calculate, and record in Table 3.1, 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 3.1, the value of $\frac{R}{l}$ for each wire.

[1]

(d) Use your results in Table 3.1 to calculate the resistance R_{25} of a 25.0 cm length of the resistance wire.

Show your working.

You must **not** carry out an experiment to measure this value.

R_{25} = ... Ω [1]

(e) Suggest **one** reason why different students, carrying out the experiment carefully with the same equipment, may **not** obtain identical results.

.....

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..... [1]

(f) A student finds that, during the experiment, the wire becomes hot because of a high current. He decides to use a variable resistor to prevent this.

Complete the circuit in Fig. 3.2 to show a variable resistor used for this purpose in the experiment.

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

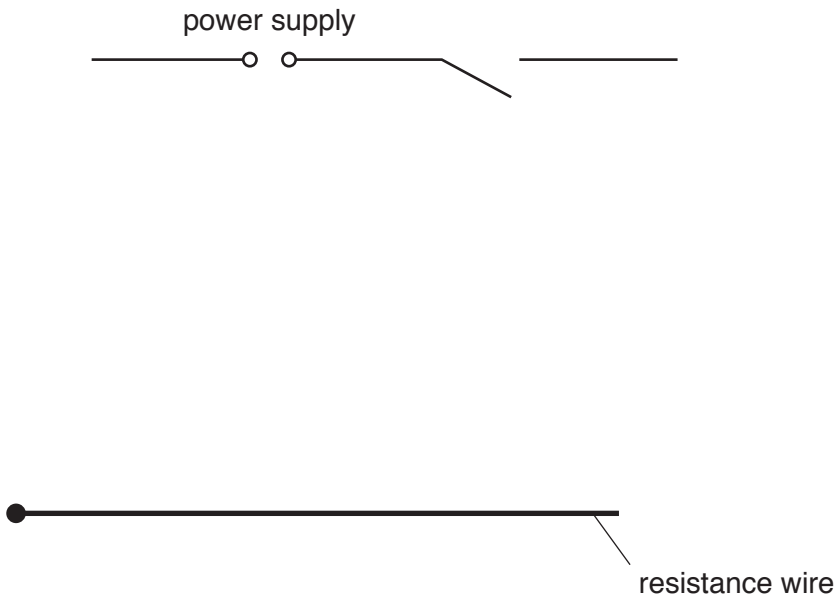


Fig. 3.2

[2]

[Total: 11]

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4 A student wants to investigate the effect of air resistance on the swing of a pendulum.

Plan an experiment which will enable him to investigate how air resistance changes the way in which a pendulum swings.

You are **not** required to carry out the experiment.

The apparatus available includes:

a light wooden rod, approximately 80 cm long with a hole at one end, through which a nail will fit
a piece of modelling clay to act as a pendulum bob, as shown in Fig. 4.1
a sheet of thick card which will provide the air resistance when the pendulum swings.

In your plan, you should:

- list any additional apparatus needed
- explain briefly how you would carry out the experiment including exactly which measurements should be taken
- 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.

You may add to Fig. 4.1 or draw an additional diagram if it helps to explain your plan.

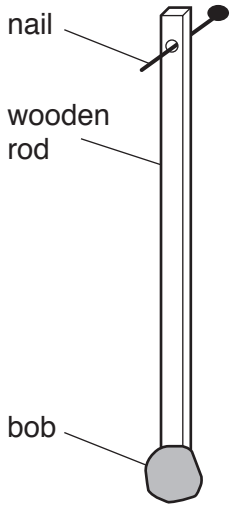


Fig. 4.1

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[Total: 7]

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