Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

5832659003

PHYSICS **0625/52**

Paper 5 Practical Test **May/June 2021**

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.

1 In this experiment, you will determine the density of sand.

Carry out the following instructions, referring to Fig. 1.1.

The beaker labelled A has a mark at the 250 cm^3 level.

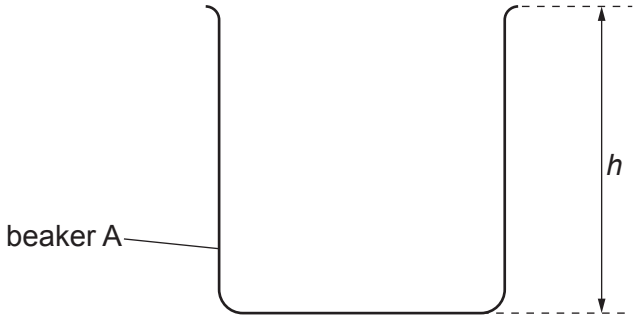

Fig. 1.1 (not to scale)

(a) Estimate the volume of water V_W that beaker A would hold when filled to the top.

V_W = ... cm^3 [1]

(b) (i) Use the string and the metre rule provided to accurately determine the circumference c of beaker A.

Record your readings and show your working.

c = ... cm [2]

(ii) Explain briefly how you used the string and the metre rule to determine c as accurately as possible. You may draw a diagram.

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..... [2]

(c) Measure the height h of beaker A, as shown in Fig. 1.1.

h ..... cm

Calculate the volume V_A of beaker A using the equation

$$V_A = \frac{hc^2}{12.6}.$$

V_A = ... cm^3 [2]

(d) (i) Beaker B contains dry sand. Pour the sand into the measuring cylinder.

- Record the volume V_S of sand.

V_S = ... cm^3

- Write down the mass m_B of beaker B, given on the card.

m_B = ... g

- Pour the sand into beaker B. Measure the mass m of beaker B containing the sand.

m = ... g

- Calculate the mass m_S of sand in the beaker. Use the equation $m_S = (m - m_B)$.

m_S = ... g
[2]

(ii) Calculate the density ρ of sand using the equation

$$\rho = \frac{m_S}{V_S}.$$

Include the unit.

ρ = ... [2]

[Total: 11]

2 In this experiment, you will investigate the position of the image in a plane mirror.

Carry out the following instructions. Use the ray-trace sheet supplied, referring to Fig. 2.1 for guidance.

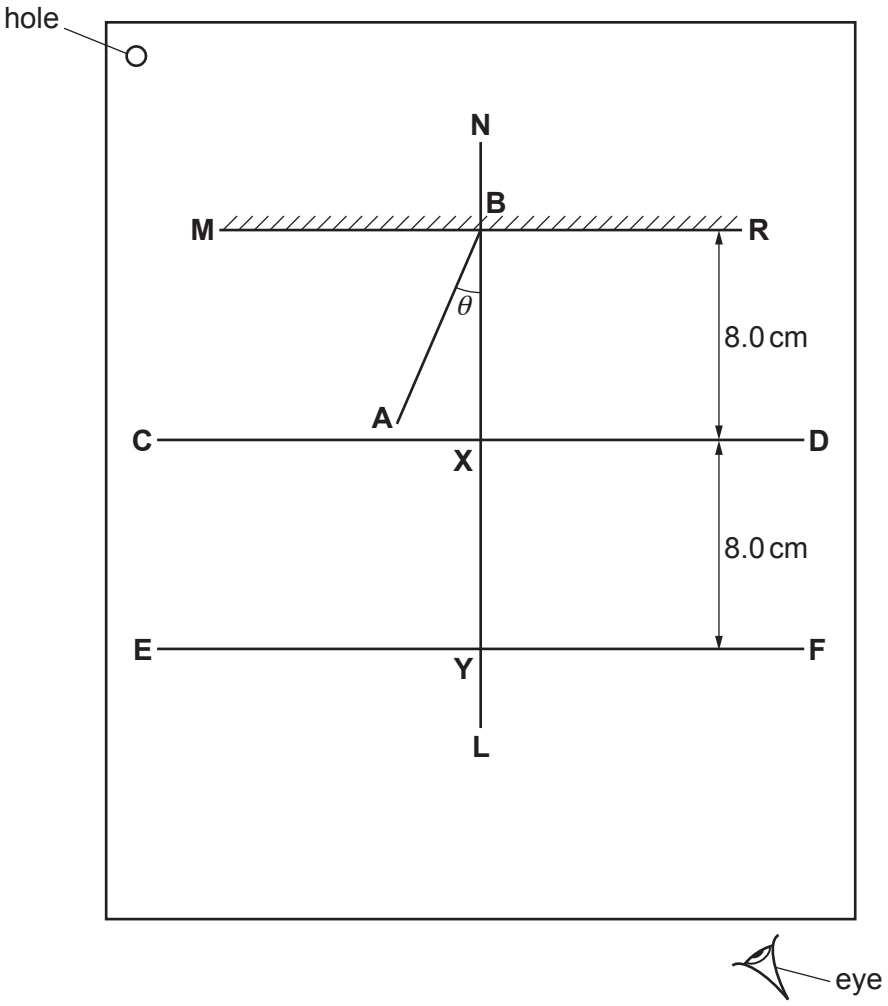

Fig. 2.1

(a) • Draw a line 10 cm long near the top of the ray-trace sheet. Label the line **MR**. Draw a normal to this line that passes through its centre. Label the normal **NL**. Label the point at which **NL** crosses **MR** with the letter **B**.

• Draw a line **CD** 8.0 cm below **MR** and parallel to **MR**.

• Label the point **X** where **CD** crosses **NL**.

• Draw a line **EF** 8.0 cm below **CD** and parallel to **CD**.

• Label the point **Y** where **EF** crosses **NL**.

[2]

(b) • Draw a line 7.0 cm long from **B** at an angle of incidence $\theta_1 = 20°$ to the normal below **MR** and to the left of the normal. Label the end of this line **A**.

• Place two pins, P_1 and P_2, on line **AB** at a suitable distance apart for this type of ray-trace experiment.

[2]

(c) Place the reflecting face of the mirror vertically on the line **MR**.

View the images of pins P_1 and P_2 from the direction indicated by the eye in Fig. 2.1. Place pin P_3 on line **CD** so that the images of P_2 and P_1 appear exactly behind pin P_3. Label the position of P_3.

Place pin P_4 on line **EF** so that pin P_3, and the images of P_2 and P_1, all appear exactly behind pin P_4. Label the position of P_4.

[1]

(d) **(i)** Measure and record the distance *a* from **X** to P_3.

a = ... [1]

(ii) Measure and record the distance *b* from **Y** to P_4.

b = ... [1]

(iii) Calculate $\frac{a}{b}$.

$\frac{a}{b}$ = ... [1]

(e) • Repeat the steps in parts **(b)** and **(c)** using an angle of incidence $\theta_2 = 10°$.

• Measure and record the distance *c* from **X** to P_3.

c = ...

• Measure and record the distance *d* from **Y** to P_4.

d = ...

• Calculate $\frac{c}{d}$.

$\frac{c}{d}$ = ...
[1]

(f) State and explain whether the values of $\frac{a}{b}$ and $\frac{c}{d}$ can be considered to be equal in this experiment.

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..... [1]

(g) A student carries out this experiment with care. Suggest a practical reason why the results may **not** be accurate.

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..... [1]

Tie your ray-trace sheet into this booklet between pages 4 and 5.

[Total: 11]

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3 In this experiment, you will investigate resistance.

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

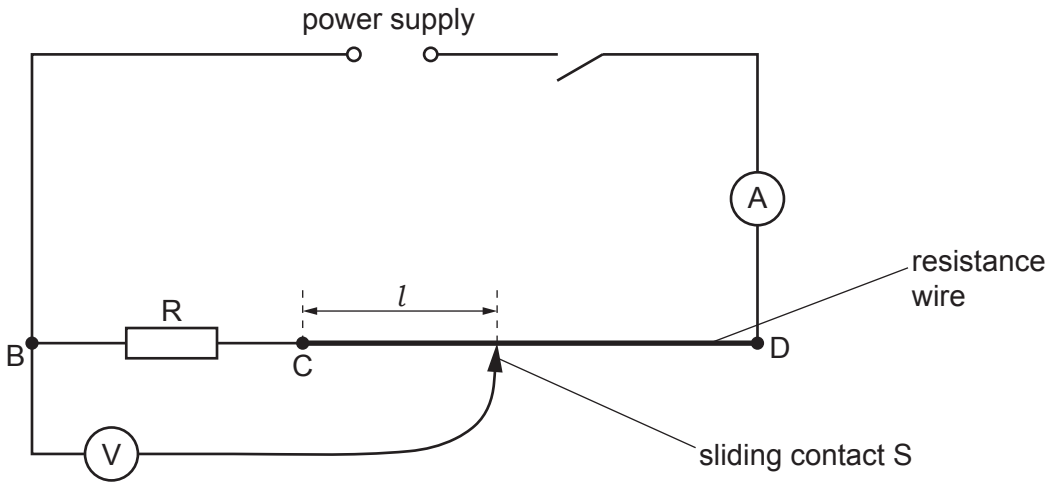


Fig. 3.1

(a) (i) Close the switch.

Measure the current I in the circuit.

I = ... [1]

(ii) Place the sliding contact S at C.

Measure the potential difference (p.d.) V_R across the resistor R.

V_R = ... [1]

Open the switch.

(iii) Calculate the resistance R of the resistor using the equation $R = \frac{V_R}{I}$.

R = ... [2]

(b) Disconnect the voltmeter from terminal B. Connect the voltmeter to terminal C. Close the switch.

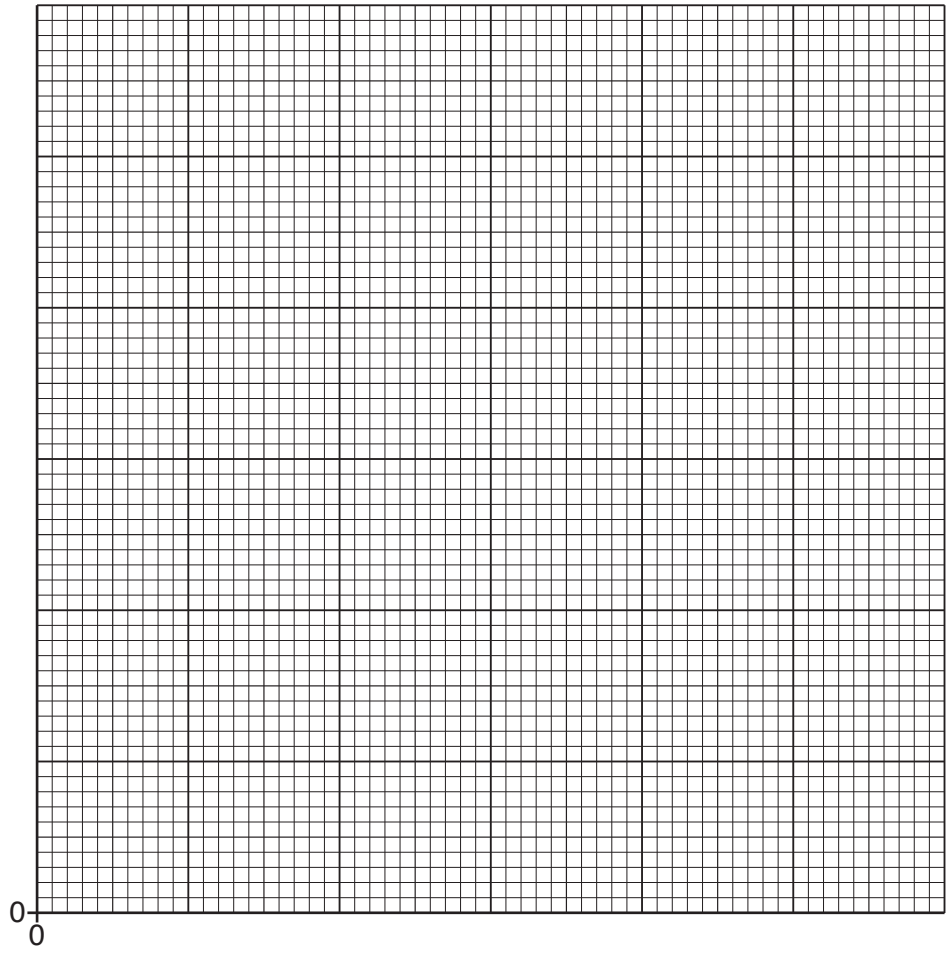
- Place the sliding contact S at a distance l = 20.0 cm from C.
- Measure, and record in Table 3.1, the reading on the voltmeter.
- Repeat the procedure using l = 40.0 cm, 60.0 cm, 80.0 cm and 100.0 cm. Open the switch.

Table 3.1

l / cm	V / V
20.0	
40.0	
60.0	
80.0	
100.0	

[1]

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



[4]

(d) Use your value of V_R from **(a)(ii)** to find the length l_R of resistance wire that has the same resistance as resistor R. Show clearly on the graph how you obtained the necessary information.

l_R = ... cm
[2]

[Total: 11]

4 A student investigates springs made from different metals.

Plan an experiment to investigate the extension of springs made from different metals.

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

The following apparatus is available:

boss, clamp and stand
metre rule
springs made from different metals
selection of loads with hangers.

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

In your plan, you should:

- write a list of suitable metals for the springs
- draw a diagram of the set up you would use
- explain briefly how to carry out the investigation
- state the key variables to keep constant
- draw a table, or tables, with column headings, to show how to display your readings (you are **not** required to enter any readings in the table)
- explain how you would use the readings to reach a conclusion.

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