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9768089966

PHYSICS **0625/53**

Paper 5 Practical Test **October/November 2025**

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	
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1 In this experiment, you will determine the volume of a block of modelling clay by two methods.
Do **not** change the shape of the block of modelling clay or remove the thread from it.

Method 1

Refer to Fig. 1.1.

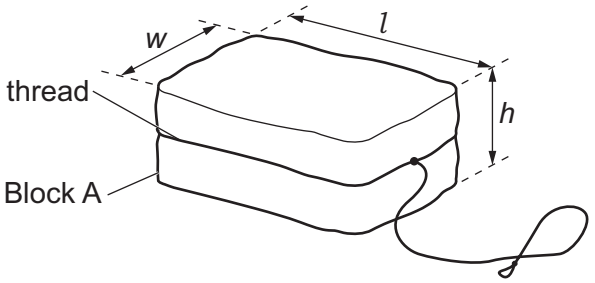


Fig. 1.1

(a) (i) Measure the length l, width w and height h of Block A. Record your values in centimetres to the nearest millimetre.

l = ... cm

w = ... cm

h = ... cm
[1]

(ii) Calculate a value V_A for the volume of Block A. Use your measurements from **(a)(i)** and the equation:

$$V_A = l \times w \times h$$

V_A = ...cm^3 [1]

(b) Suggest a possible source of inaccuracy in measuring the dimensions of Block A.

Describe how the accuracy of these measurements can be improved.
You are **not** required to carry out this improved procedure.

source of inaccuracy .....

.....

improvement .....

.....
[2]

(c) A student measures the dimensions of a block of clay which is much smaller than Block A. Suggest why these measurements may not be as accurate as yours, even if they are done carefully.

.....

.....

..... [1]

Method 2

(d) (i) Pour approximately 150 cm^3 of water into the measuring cylinder.

Measure and record the actual volume V_1 of the water in the measuring cylinder.

V_1 = ... cm^3

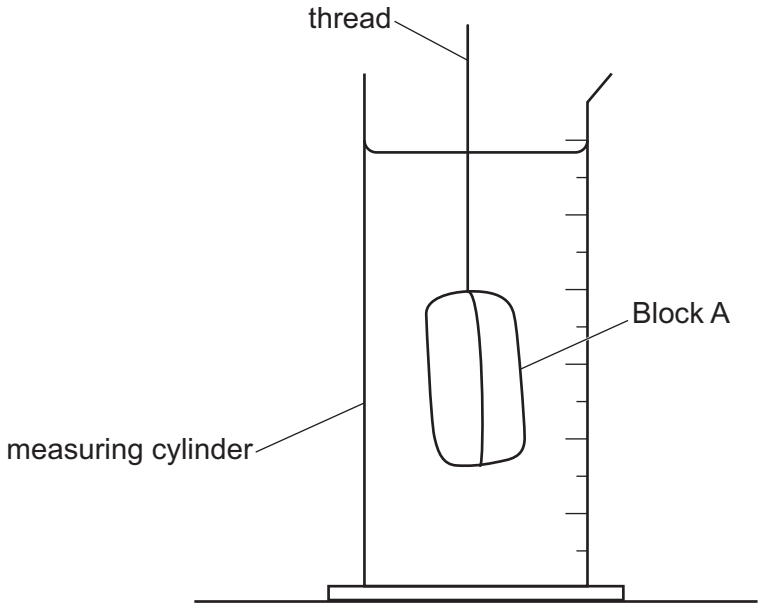


Fig. 1.2

Lower Block A into the water in the measuring cylinder using the thread, as shown in Fig. 1.2.

Measure and record the new reading V_2 shown on the measuring cylinder scale.

V_2 = ... cm^3
[1]

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(ii) Calculate another value V_B for the volume of Block A.
Use your measurements from **(d)(i)** and the equation:

$$V_B = (V_2 - V_1).$$

V_B = ... cm^3
[2]

(iii) Draw an arrow on the enlarged section of Fig. 1.3 to show the correct line of sight to obtain the value for the volume of water in the measuring cylinder.

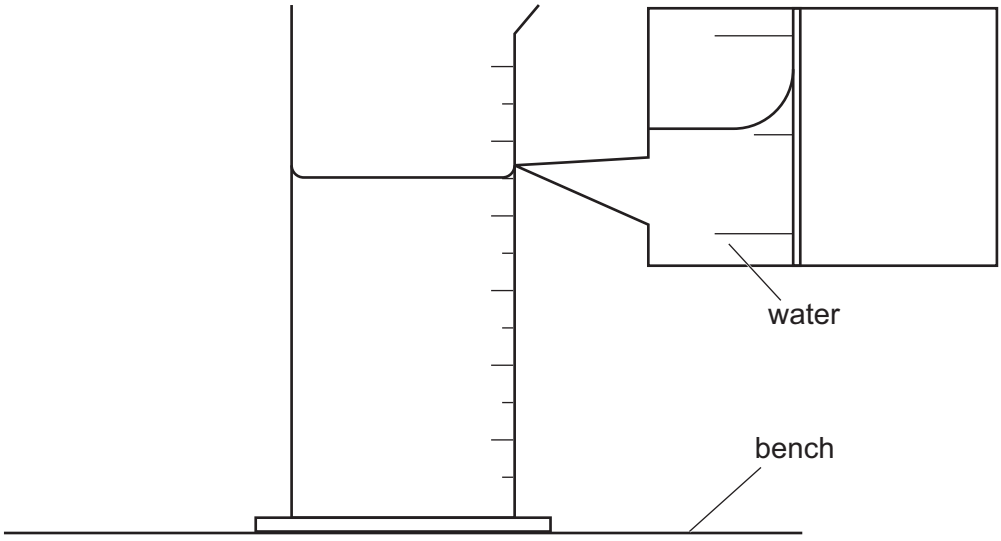


Fig. 1.3

[2]

(e) Suggest **one** possible source of inaccuracy in Method 2.

.....

..... [1]

[Total: 11]

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2 In this experiment, you will investigate the resistances of identical wires connected in parallel.

A circuit has been set up for you. Resistor R_P must remain in place throughout the experiment.

Refer to Fig. 2.1.

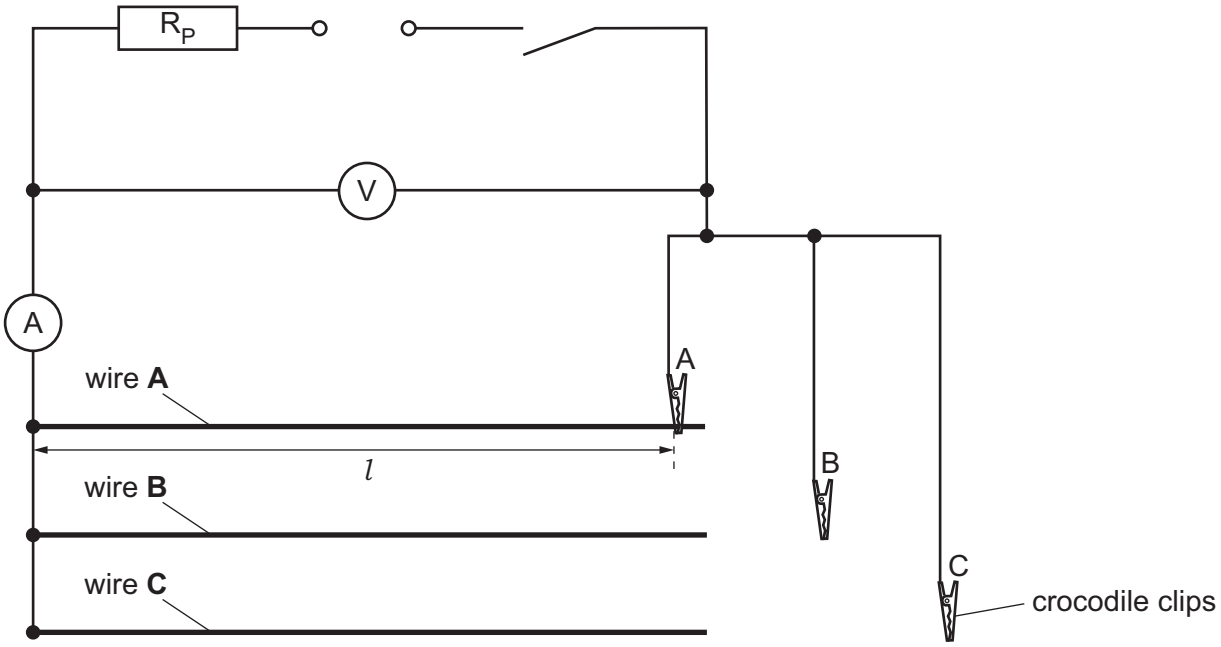


Fig. 2.1

Circuit A

Move crocodile clip A to a length l = 95.0 cm of resistance wire A.

(a) Close the switch.

Measure, and record in Table 2.1, the values of potential difference (p.d.) V across the resistance wire and current I in the circuit.

Open the switch.

Table 2.1

circuit	V/V	I/A	R/Ω
A			
B			
C			

[2]

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Circuit B

Do **not** disconnect crocodile clip A.

Connect crocodile clip B to a length l = 95.0 cm of resistance wire B.
It does not matter if crocodile clip A and crocodile clip B touch.
Wire A and wire B are now connected in parallel.

(b) Repeat step **(a)**. [1]

Circuit C

Do **not** disconnect crocodile clips A or B.

Connect crocodile clip C to a length l = 95.0 cm of resistance wire C.
It does not matter if the crocodile clips touch.
Wire A, wire B and wire C are now connected in parallel.

(c) Repeat step **(a)**. [1]

(d) For each circuit, calculate, and record in Table 2.1, the resistance R of the wire combinations.
Use your values of V and I and the equation:

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

[2]

(e) **(i)** Record a resistance R_A. R_A is the value of R from Circuit A.

R_A = ... Ω

Calculate a resistance R_B. Use the value of R from Circuit B and the equation:

$$R_B = R \times 2$$

R_B = ... Ω

Calculate a resistance R_C. Use the value of R from Circuit C and the equation:

$$R_C = R \times 3$$

R_C = ... Ω
[2]

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(ii) A student suggests that the values of R_A, R_B and R_C should be equal.

State whether your results support this suggestion. Use values from your results to justify your answer.

statement .....

justification .....

.....

.....

[2]

(f) Briefly explain why resistor R_P, shown in Fig. 2.1, must remain in place throughout the experiment.

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..... [1]

[Total: 11]

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

Refer to Fig. 3.1.

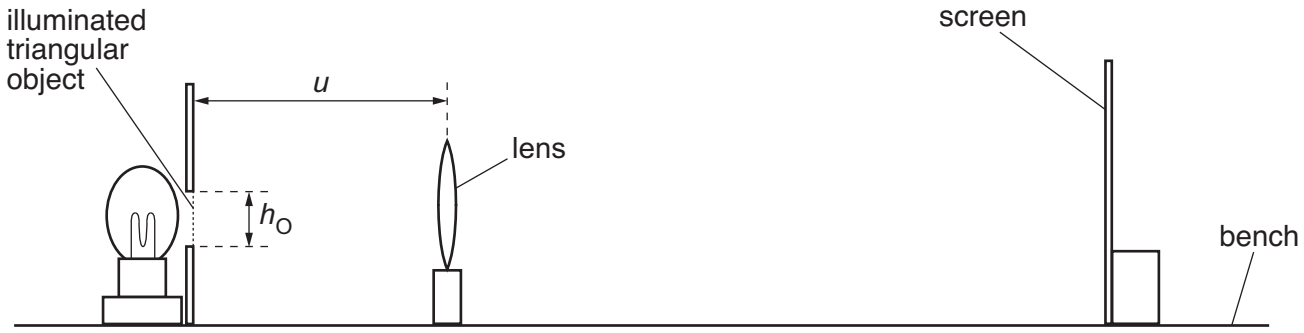


Fig. 3.1

(a) (i) Measure the height h_O of the triangular object provided.

h_O = ... cm

- Place the lens a distance u = 20.0 cm from the illuminated triangular object.
- Place the screen close to the lens.
- Switch on the lamp.
- Move the screen away from the lens until a clear focused image of the triangular object is seen on the screen.
- Measure, and record in Table 3.1, the height h_I of the image.

Describe **one** technique you used to produce an image on the screen which is as sharp as possible in this experiment.

.....

.....

[1]

(ii) Repeat the procedure for u = 25.0 cm, u = 30.0 cm, u = 35.0 cm and u = 40.0 cm. Switch off the lamp.

Table 3.1

u / cm	h_I / cm	$D / \frac{1}{\text{cm}}$
20.0		
25.0		
30.0		
35.0		
40.0		

[1]

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(b) For each distance u, calculate, and record in Table 3.1, a value D.

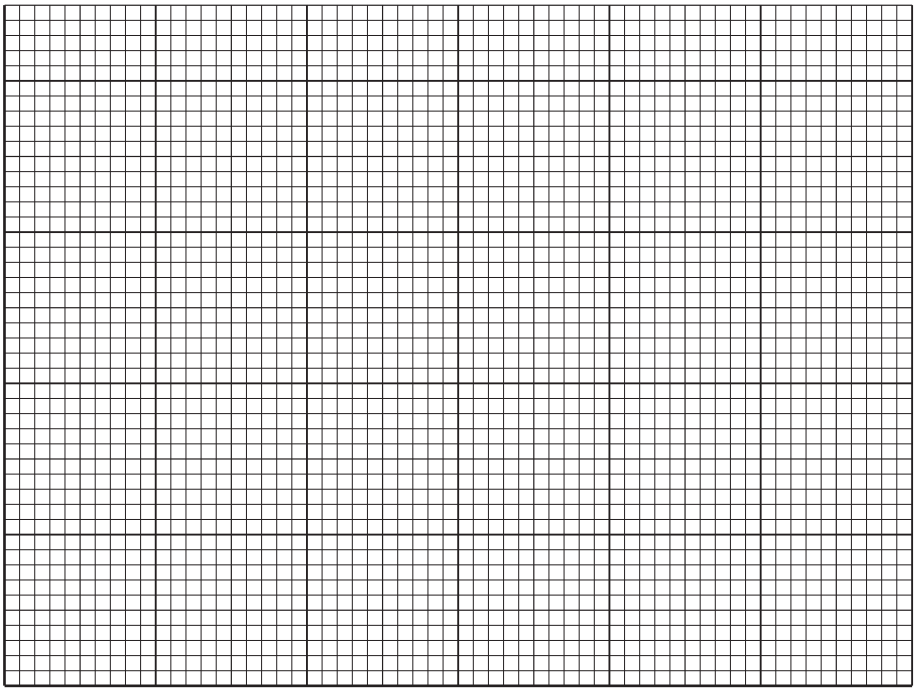
Use your values of h_I from Table 3.1 and the equation:

$$D = \frac{1}{h_I}.$$

[1]

(c) Plot a graph of u/cm (y-axis) against $D/\frac{1}{\text{cm}}$ (x-axis). Start the axes at the origin (0,0).

Draw a best-fit straight line.



[4]

(d) **(i)** From your graph, determine u_0, the value of u when D is zero.

u_0 = ... cm [1]

(ii) Determine the gradient G of the graph.

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

G = ... [1]

(iii) Calculate the focal length f of the lens. Use your value of h_O from **(a)** and the equation:

$$f = \frac{G}{h_O} \times k, \qquad \text{where } k = 1.0\,\text{cm}^2.$$

f = ... cm [1]

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(e) Describe **one** difficulty that can be experienced when measuring the height of the image in this experiment.

Suggest an improvement to overcome this difficulty.

difficulty .....

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improvement .....

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[1]

[Total: 11]

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4 A student investigates the evaporation of water in an open dish.

Plan an experiment which will enable the student to compare the effect on evaporation of using different diameters of dish.

The mass m_e of water evaporated can be determined by using the equation:

$$m_e = m_b - m_a$$

where m_b = the mass of water in the dish before experiment and
m_a = the mass of water in the dish after experiment.

The apparatus available includes:

- a range of shallow dishes with different diameters
- an adjustable laboratory lamp to heat the water
- a variable power supply for the lamp
- a stop-watch
- a supply of cold water.

You are **not** required to do the experiment.
You do **not** need to write about any safety precautions.

In your plan:

- list any additional apparatus needed
- explain briefly how to do the experiment, including what measurements need to be taken
- state the key variables to keep constant
- draw a table, or tables, with column headings, to show how to display the readings (you are **not** required to enter any readings in the table)
- explain how to use the readings to reach a conclusion.

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

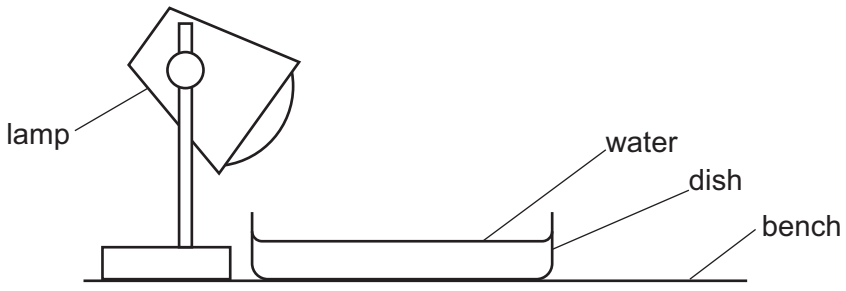


Fig. 4.1

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