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PHYSICS **0625/61**

Paper 6 Alternative to Practical **May/June 2026**

1 hour

You must answer on the question paper.

No additional materials are needed.

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. Do **not** use correction fluid or tape.
- 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 [ ].

This document has **12** pages. Any blank pages are indicated.

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1 A student investigates the balancing of a metre ruler.

Refer to Figure 1.1.

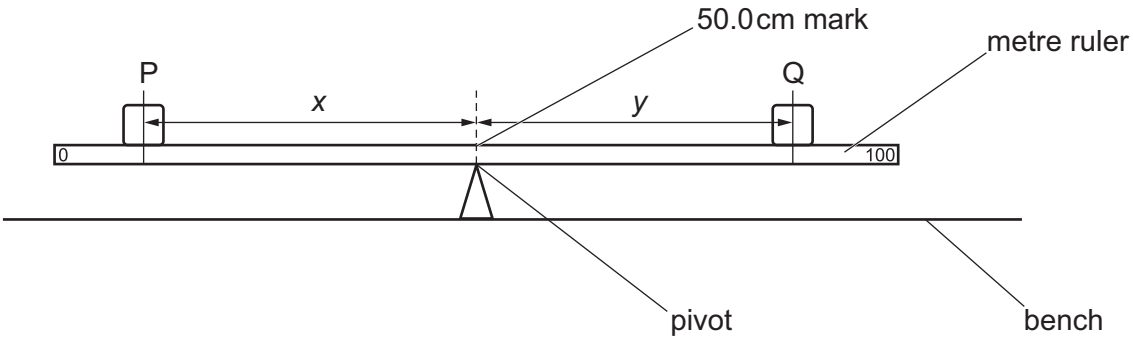

Figure 1.1

The student:

- places a metre ruler with the 50.0 cm mark exactly above the pivot
- places an object P with its centre on the metre ruler at the 10.0 cm mark
- records, in Table 1.1, the distance x = 40.0 cm between the centre of object P and the 50.0 cm mark
- places an object Q on the metre ruler
- adjusts the position of Q until the metre ruler is as close as possible to being balanced
- records, in Table 1.1, the distance y between the centre of object Q and the 50.0 cm mark.

The student repeats the steps above using distances of x = 35.0 cm, 30.0 cm, 25.0 cm and 20.0 cm.

The values of x and y are recorded in Table 1.1.

Table 1.1

***x*/cm**	***y*/cm**
40.0	27.0
35.0	24.5
30.0	19.5
25.0	17.0
20.0	13.5

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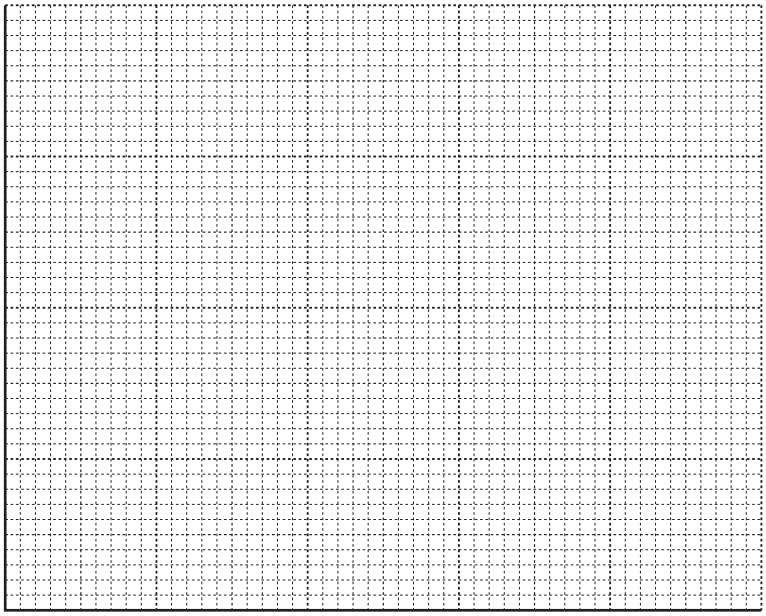
(a) Plot a graph of y / cm (y-axis) against x / cm (x-axis). You do **not** need to start the axes at the origin (0,0).

View solution

Draw a best-fit straight line.



[4]

(b) Determine the gradient G of the graph. Show clearly on the graph how you obtained the necessary information.

View solution

G = ... [3]

(c) The gradient G of the graph is equal to the ratio $\frac{W_P}{W_Q}$, where W_P is the weight of object P and W_Q is the weight of object Q.

View solution

W_P = 2.0 N.

Calculate W_Q. Show your working.

W_Q = ... [2]

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(d) Explain how to place the centre of object P on the 10.0 cm mark as accurately as possible. Draw a diagram to illustrate your answer.

View solution

.....

.....

..... [2]

[Total: 11]

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2 A student investigates resistance.

Refer to Figure 2.1.

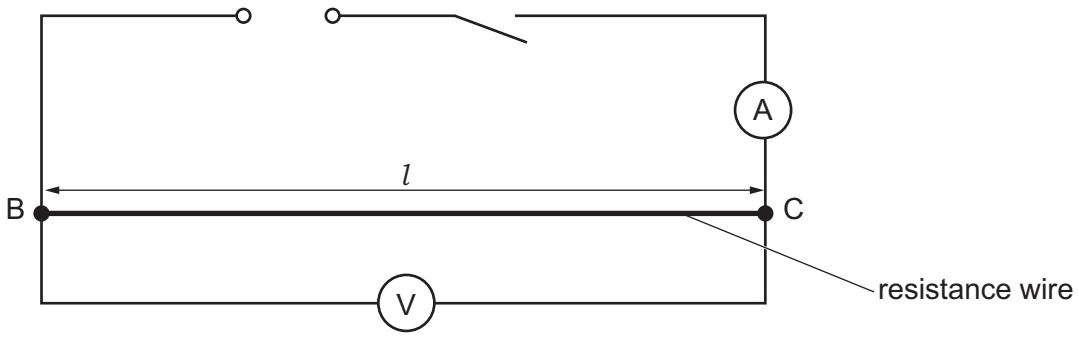

Figure 2.1

(a) Figure 2.2 shows the readings on the meters.

View solution

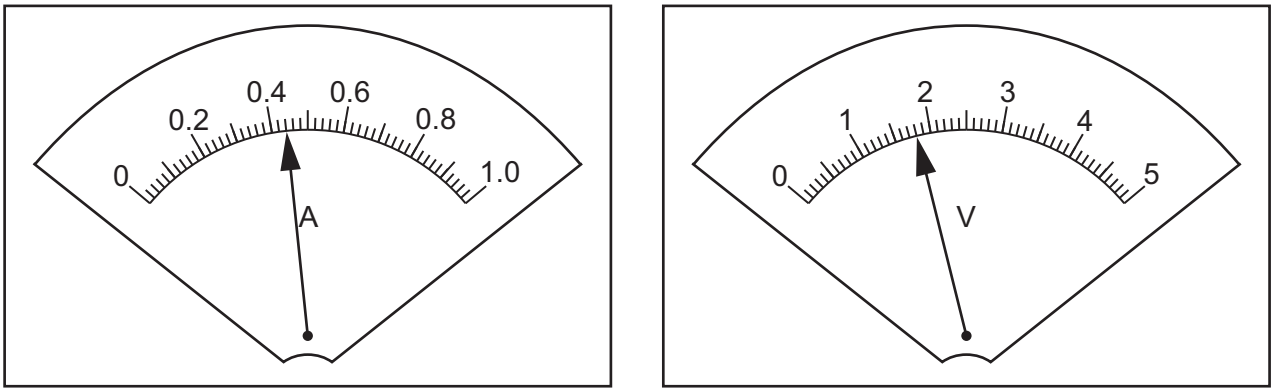

Figure 2.2

(i) Record the current I_1 shown in Figure 2.2. Include the unit.

I_1 = ... unit ..... [1]

(ii) Record the potential difference (p.d.) V_1 across the resistance wire BC shown in Figure 2.2. Include the unit.

View solution

V_1 = ... unit ..... [2]

(iii) Calculate the resistance R_1 of the resistance wire using the equation:

View solution

$$R_1 = \frac{V_1}{I_1}.$$

R_1 = ... Ω [1]

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(iv) The length of the resistance wire is 50 cm.

View solution

Calculate r, the resistance per cm of the resistance wire, using the equation:

$$r = \frac{R_1}{50\,\text{cm}}.$$

r = ... Ω / cm [1]

(b) The student has a length of the same resistance wire wound on a wooden rod, as shown in Figure 2.3.

View solution

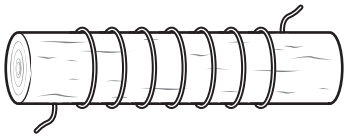

Figure 2.3

(i) Record the number of whole turns N of wire on the rod.

N = ... [1]

(ii) The student measures the diameter d of the rod.

View solution

d = 2.3 cm

Calculate a value l_1 for the length of wire on the rod using the equation:

$$l_1 = N\pi d.$$

l_1 = ... cm [1]

(c) The student:

- disconnects the resistance wire from the circuit shown in Figure 2.1
- connects the wire on the rod to the circuit at B and C
- measures the current I_2 in the circuit

I_2 = 0.41 A

- measures the potential difference (p.d.) V_2 across the resistance wire on the rod.

V_2 = 1.8 V

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(i) Calculate the resistance R_2 of the resistance wire on the rod using the equation:

View solution

$$R_2 = \frac{V_2}{I_2}.$$

R_2 = ... Ω [1]

(ii) Calculate another value l_2 for the length of resistance wire on the rod using your values from **2(a)(iv)** and **2(c)(i)** and the equation:

View solution

$$l_2 = \frac{R_2}{r}.$$

Give your answer in centimetres to the nearest millimetre.

l_2 = ... cm [1]

(d) The values of the lengths l_1 and l_2 are different from each other.

View solution

The value l_1 from **2(b)(ii)** is from distance measurements. The value l_2 from **2(c)(ii)** involves electrical measurements.

Suggest which value, l_1 or l_2, is more accurate. Give a reason for your answer, comparing the two methods.

suggestion .....

reason .....

.....

.....

[2]

[Total: 11]

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3 A student investigates the image produced by a lens.

Refer to Figure 3.1.

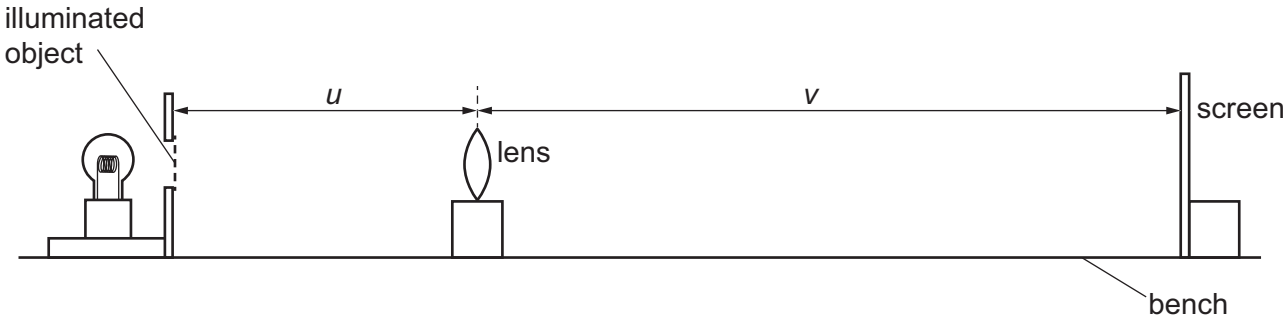

Figure 3.1

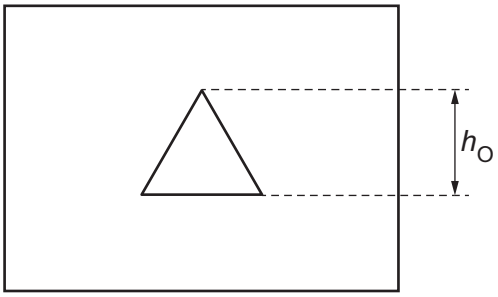

Figure 3.2

(a) Measure the height h_O of the illuminated object in Figure 3.2.
Give your answer in centimetres to the nearest millimetre. Include the unit.

View solution

h_O = ... unit ..... [2]

(b) The student:

- places the lens a distance U = 20.0 cm from the illuminated object
- adjusts the position of the screen until a focused image is formed on the screen.

View solution

(i) On Figure 3.1, measure the distance v between the centre of the lens and the screen.

v = ... cm [1]

(ii) The diagram is $\frac{1}{5}$th actual size.

Calculate the actual distance V between the centre of the lens and the screen.

View solution

V = ... cm [1]

(c) The student measures the height h_1 of the image on the screen.

View solution

h_1 = 3.3 cm

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Calculate the magnification m_1 using the equation:

$$m_1 = \frac{h_1}{h_O}.$$

Give your answer to a suitable number of significant figures for this experiment.

m_1 = ... [1]

View solution

(d) The student:

- moves the lens to a distance V from the illuminated object
- adjusts the position of the screen until a focused image is formed on the screen
- measures the height h_2 of the image.

h_2 = 0.6 cm

Calculate the magnification m_2 using the equation:

$$m_2 = \frac{h_2}{h_O}.$$

Give your answer to a suitable number of significant figures for this experiment.

m_2 = ... [2]

View solution

(e) A student suggests that the product $m_1 \times m_2$ should be 1.00.

State whether your results support this suggestion and justify your answer by reference to the results.

statement .....

justification .....

.....

[2]

View solution

(f) In this type of experiment, it can be difficult to judge the screen position that produces the clearest image.

Suggest **two** techniques to overcome this difficulty.

1 .....

.....

2 .....

.....

[2]

[Total: 11]

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4 A student investigates the time taken to boil water when heated in containers made from different metals.

View solution

The containers are heated on an electric hotplate, as shown in Figure 4.1.

Plan an experiment to compare how quickly water reaches boiling point in the different containers.

The following apparatus is available to the student:

- containers labelled A, B, C, D and E. The containers are identical except that each is made from a different metal
- supply of cold water
- electric hotplate.

Other apparatus normally available in a school laboratory can also be used.

In your plan:

- name any other apparatus needed
- give a brief description of the method, including what you will measure and how you make sure that your measurements are accurate
- state the key variables to be kept constant
- draw a table, 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.

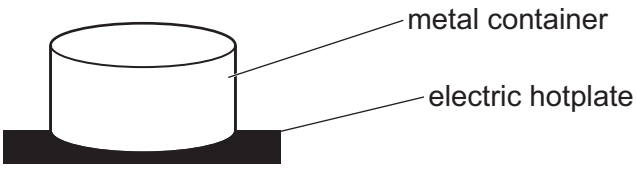

Figure 4.1

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