



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

PHYSICS

0625/05

Paper 5 Practical Test

May/June 2007

1 hour 15 minutes

Additional Materials: As listed in the Confidential Instructions



READ THESE INSTRUCTIONS FIRST

If you have been given an Answer Booklet, follow the instructions on the front cover of the Booklet.

Write your Centre number, candidate number and name on all the work you hand in.

Write in dark blue or black pen.

Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions.

You are expected to record all your observations as soon as these observations are made.

An account of the method of carrying out the experiments is **not** required.

At the end of the examination, hand in only the Answer Booklet.

This document consists of **8** printed pages and **1** Answer Booklet.



- 1 In this experiment you are to investigate the temperature of a mixture of hot and cold water.

Record all of your observations on page 2 of your Answer Booklet.

Carry out the following instructions referring to Fig. 1.1.

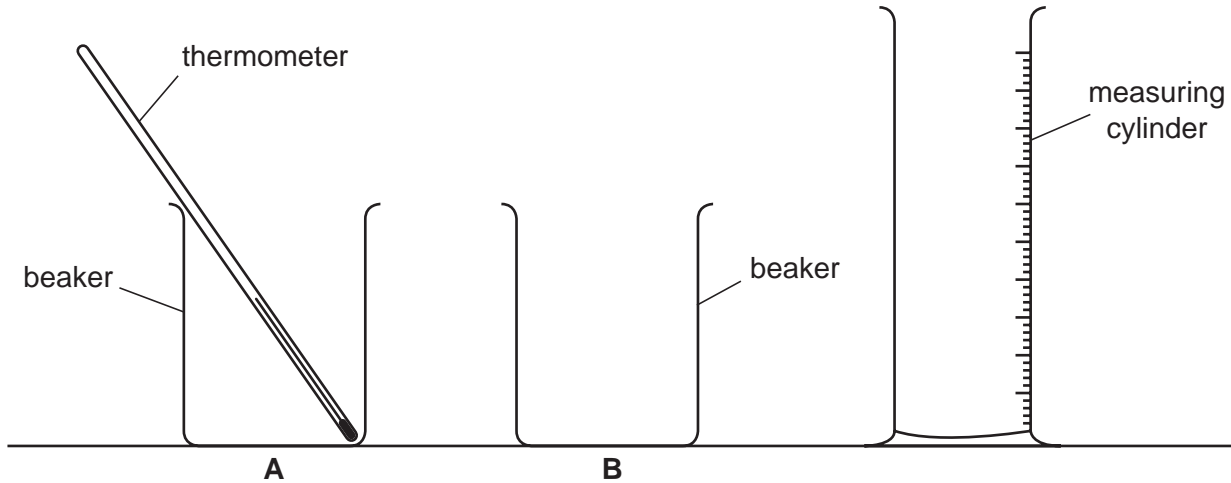


Fig. 1.1

- (a) Pour 50 cm^3 of water from the supply labelled 'water at room temperature' into the measuring cylinder. Transfer this to the beaker labelled **A**.
- (b) Measure and record the temperature θ_1 of the water in beaker **A**.
- (c) Pour 50 cm^3 of water from the supply labelled 'hot water' into the measuring cylinder. Transfer this to the beaker labelled **B**.
- (d) Measure and record the temperature θ_2 of the water in beaker **B**.
- (e) As soon as you have recorded the temperature θ_2 pour the water from beaker **B** into beaker **A**.
- (f) Measure and record the temperature θ_3 of the mixture of hot and cold water in beaker **A**.
- (g) Do not pour the water out of beaker **A**. Repeat steps (c) and (d) and record the new value of θ_2 .

- (h) As soon as you have recorded the new temperature θ_2 add the water from beaker B to the water already in beaker A.
- (i) Measure and record the new temperature θ_3 of the mixture of hot and cold water in beaker A.
- (j) A theoretical calculation based on the equation

$$\text{thermal energy lost by hot water} = \text{thermal energy gained by cold water}$$

predicts higher values of the temperature θ_3 than the values that are obtained by this experiment.

Suggest

- (i) a practical explanation for this difference,
- (ii) two practical improvements that you could make to the procedure for this experiment to obtain a result that is closer to the theoretical result.

2 In this experiment you are to investigate the position of a sheet of card that is held in a vertical position by a pivot.

Record all of your observations on page 3 of your Answer Booklet.

Carry out the following instructions referring to Fig. 2.1.

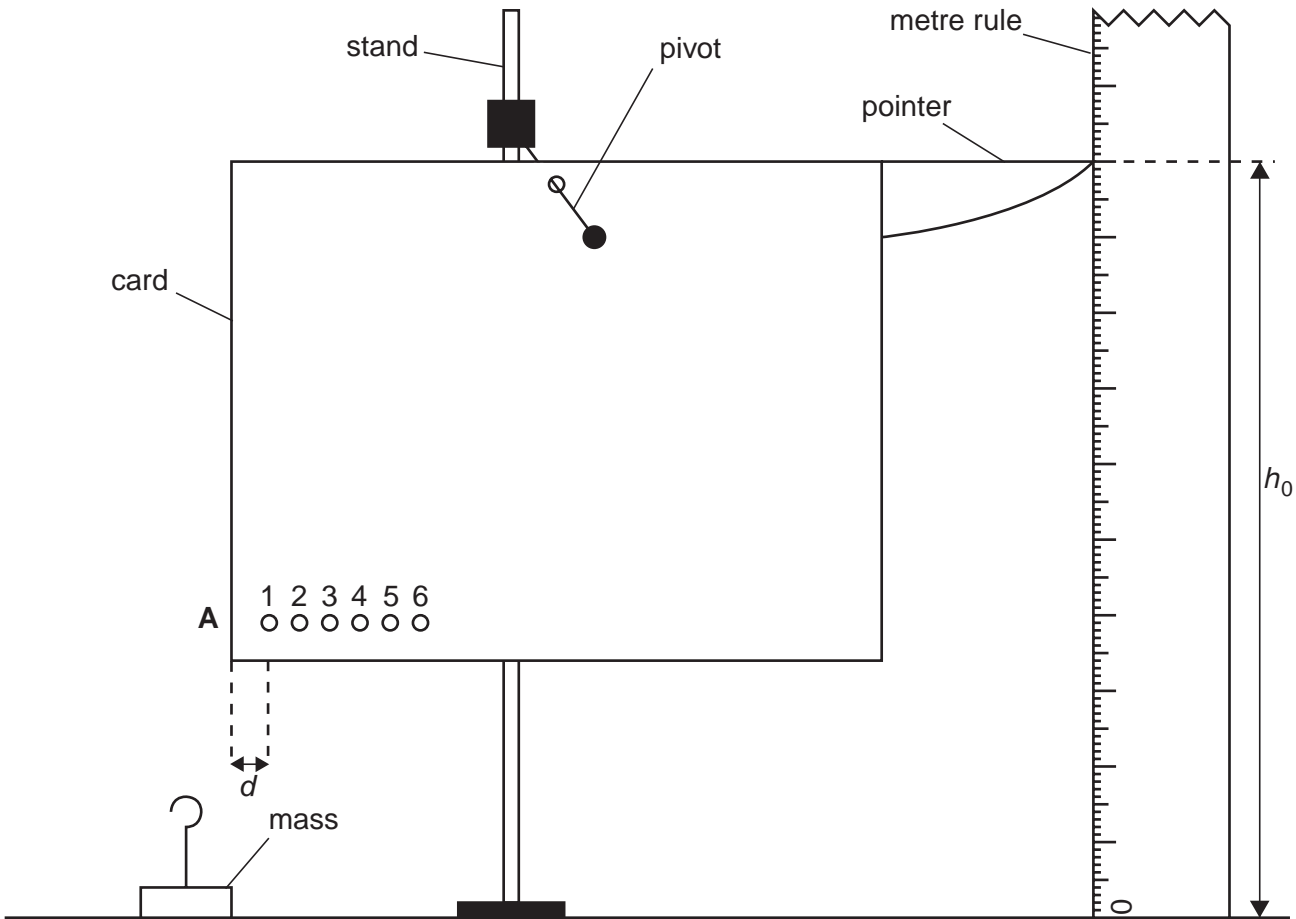


Fig. 2.1

5

- (a) Place the metre rule close to the end of the pointer as shown in Fig. 2.1. The rule is vertical. Record the height h_0 of the pointer above the bench.
- (b) Remove the card from the pivot.
- (c) Measure and record the distance d between the centre of the hole labelled **1** and the edge of the card at **A** as shown in Fig. 2.1.
- (d) Repeat step (c) for each of the remaining holes **2 – 6**.
- (e) Replace the card on the pivot as shown in Fig. 2.1.
- (f) Hang the 50g mass from the hole **1** in the card. Record the new height h of the pointer above the bench.
- (g) Calculate the difference in heights b using the equation

$$b = (h - h_0).$$

- (h) Repeat steps (f) and (g) for each of the remaining holes **2 – 6**.
- (i) Plot the graph of b/mm (y-axis) against d/mm (x-axis).
- (j) A student suggests that b is directly proportional to d . By reference to your graph state whether or not your results support the student's suggestion. Give a reason for your answer.
- (k) It is important when recording the heights that the rule is vertical. State briefly how you checked that the rule was vertical.

3 In this experiment you will investigate the resistance of a wire.

Record all of your observations and answers on page 4 of your Answer Booklet.

Carry out the following instructions referring to Fig. 3.1, which shows the circuit that has been set up for you.

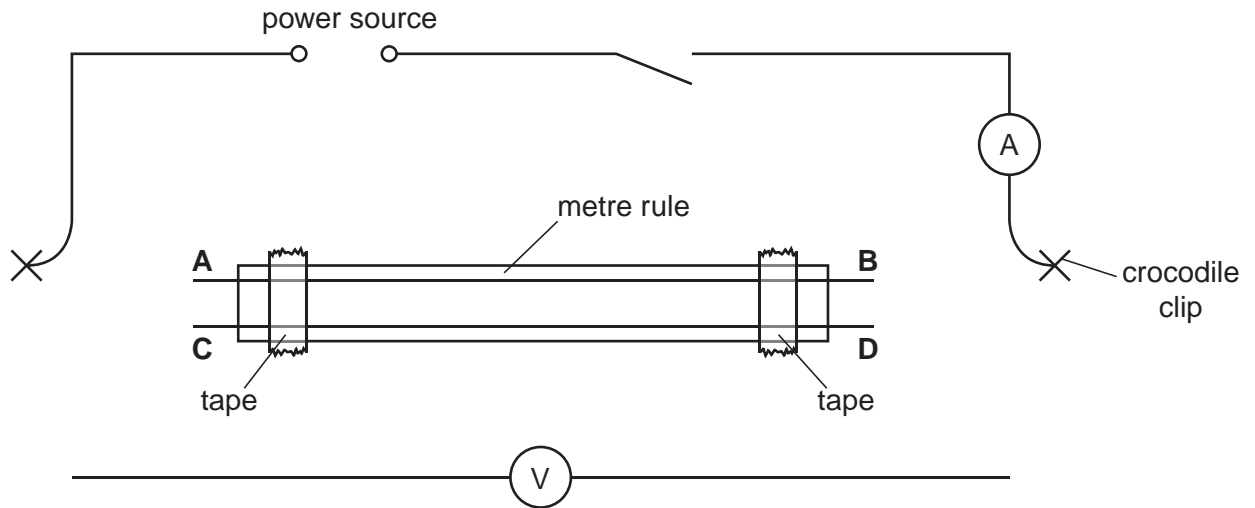


Fig. 3.1

You are provided with two lengths of resistance wire **AB** and **CD**.

- (a) Connect the wire **AB** between the two crocodile clips.
- (b) Switch on and, using the voltmeter, record the p.d. V across the wire between **A** and **B**.
- (c) Using the ammeter, record the current I in the wire.

- (d) Switch off.
- (e) Calculate the resistance R of the wire **AB**, using the equation

$$R = V/I.$$

- (f) Repeat the steps (a) to (e) using the wire **CD**.
- (g) Complete the column headings in the table.
- (h) The two wires, **AB** and **CD** are made of the same material and are of the same length. The diameter of wire **AB** is half the diameter of wire **CD**. Look at the results in the table. Here are four possible relationships between R and the diameter d of the wire. Select the relationship that best matches your results. Tick the appropriate box in the Answer Booklet.
- R is proportional to d
 - R is proportional to $1/d$
 - R is proportional to d^2
 - R is proportional to $1/d^2$
- (i) Explain the reason for your answer.

4 In this experiment you will investigate the formation of images by a lens.

Record all of your observations and answers on page 5 of your Answer Booklet.

Carry out the following instructions referring to Fig. 4.1.

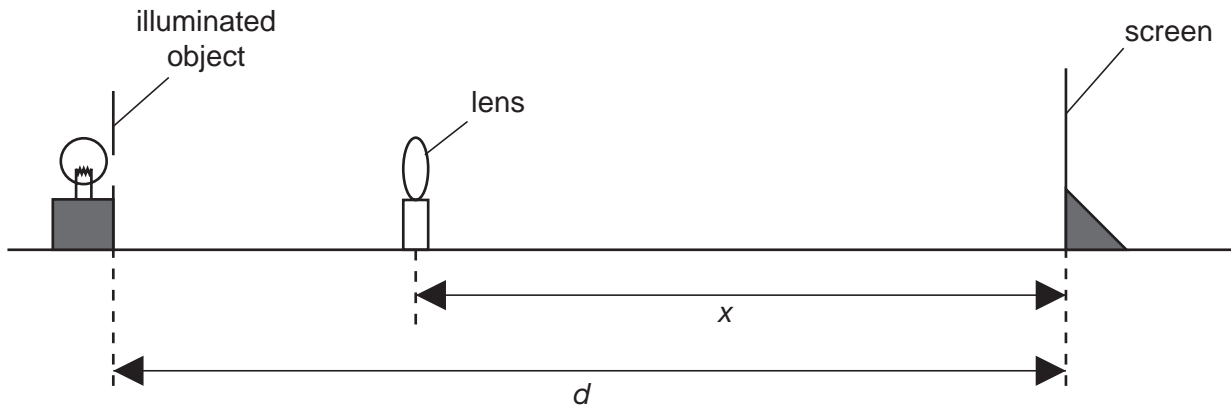


Fig. 4.1

- Place the screen at a distance $d = 0.800$ m from the illuminated object.
- Place the lens between the object and the screen and adjust its position until a clearly focused magnified image is formed on the screen.
- Measure and record the distance x between the centre of the lens and the screen.
- Without moving the illuminated object or the screen, move the lens towards the screen until a clearly focused diminished image is formed on the screen.
- Measure and record the distance y between the centre of the lens and the screen.
- Calculate the focal length f of the lens using the equation
$$f = \frac{xy}{d}.$$
- Repeat steps (a) to (f) with the distance d increased to 0.900 m.
- Calculate the average value of the focal length f .
- Outline any two steps that you took in this experiment in order to obtain an accurate result.