Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

1804511447

PHYSICS **0625/51**

Paper 5 Practical Test **October/November 2014**

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.
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	

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **11** printed pages and **1** blank page.

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1 In this experiment, you will take measurements of a drinks cup.

Carry out the following instructions referring to Fig. 1.1.

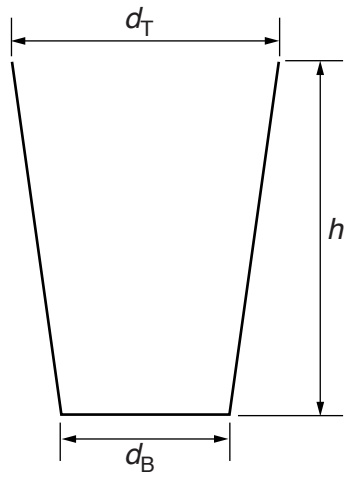


Fig. 1.1

(a) (i) Measure and record the height h of the cup supplied.

h = ... cm

(ii) Measure and record the diameter d_T of the top of the cup.

d_T = ... cm

(iii) Measure and record the diameter d_B of the bottom of the cup.

d_B = ... cm

(iv) Calculate the average diameter d_A using the equation $d_A = \frac{d_T + d_B}{2}$.

d_A = ... cm

(v) Calculate an approximate value for the volume V of the cup, using the equation $V = \frac{\pi d_A^2 h}{4}$.

V = ...
[4]

(b) (i) Use the string and the metre rule to determine the average circumference (distance around the outside) C of the cup. Show your working.

C = ... cm [3]

(ii) Draw a diagram of the cup to show where you used the string to determine the average circumference C.

[1]

(c) Place the cup in the container provided. The container is to catch any water that may spill.

(i) Use the measuring cylinder to determine the volume V_W of water required to fill the cup to the top.

V_W = ... [1]

(ii) State which of the two values, V_W or V obtained in **(a)(v)**, you would expect to be the more reliable value for the volume of the cup. Explain your answer.

more reliable value .....

explanation .....

.....

[1]

[Total: 10]

2 In this experiment, you will investigate the cooling of hot water under different conditions.

Carry out the following instructions, referring to Figs. 2.1 and 2.2.

(a) Measure and record room temperature θ_R.

θ_R = ... [1]

(b) Pour hot water into the beaker labelled **A** until it is about two-thirds full. Place the thermometer in the beaker of hot water, as shown in Fig. 2.1.

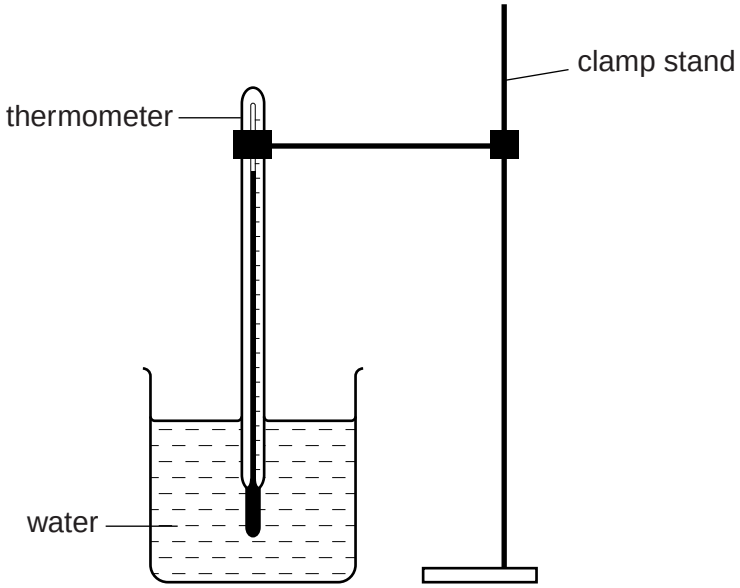


Fig. 2.1

(i) Wait until the thermometer reading stops rising. Read the temperature θ of the hot water and immediately start the stopclock. Record the temperature θ in Table 2.1 at time t = 0 s.

(ii) After 30 s, measure the temperature θ shown on the thermometer. Record the time t = 30 s and the temperature reading in Table 2.1.

(iii) Continue recording the time and temperature readings every 30 s until you have six sets of readings.

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Table 2.1

	without insulation	with insulation
t/	θ/	θ/

[5]

(c) Complete the column headings in the table.

(d) Pour hot water into the insulated beaker until it is about two-thirds full. Place the thermometer in the beaker of hot water, as shown in Fig. 2.2.

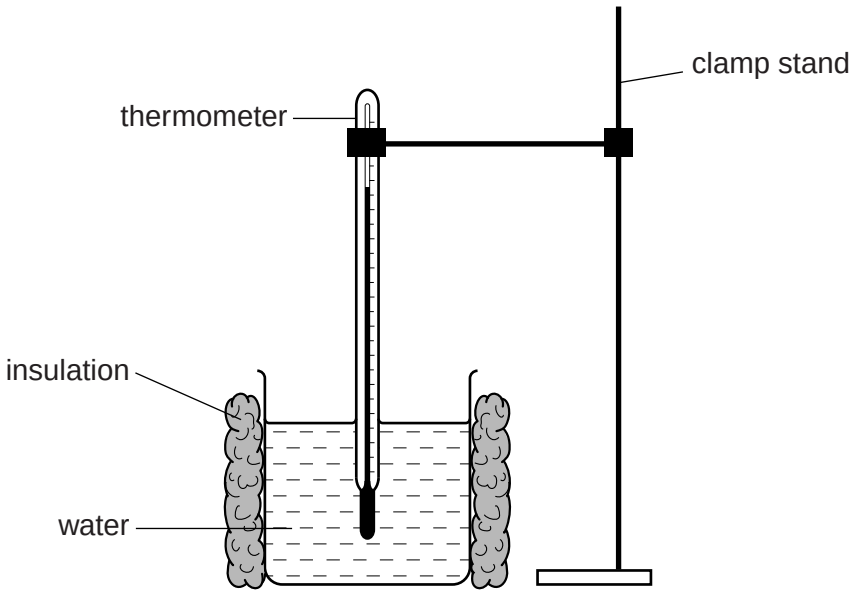


Fig. 2.2

(i) Wait until the thermometer reading stops rising. Read the temperature θ of the hot water and immediately start the stopclock. Record the temperature θ in Table 2.1 at time t = 0 s.

(ii) After 30 s, measure the temperature θ shown on the thermometer. Record the time t = 30 s and the temperature reading in Table 2.1.

(iii) Continue recording the time and temperature readings every 30 s until you have six sets of readings.

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(e) State whether the cotton wool insulation increases, decreases, or has no significant effect on the rate of cooling of the water, compared with the rate of cooling with no insulation. Justify your answer by reference to your results.

statement .....

justification .....

.....

.....

.....

[2]

(f) A student suggests that a significant cause of loss of thermal energy from the beakers is evaporation.

Suggest how you would reduce the evaporation in this experiment.

.....[1]

(g) Suggest one condition that should not be changed when this experiment is repeated.

.....[1]

[Total: 10]

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Question 3 begins on page 8

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

The circuit shown in Fig. 3.1 has been set up for you.

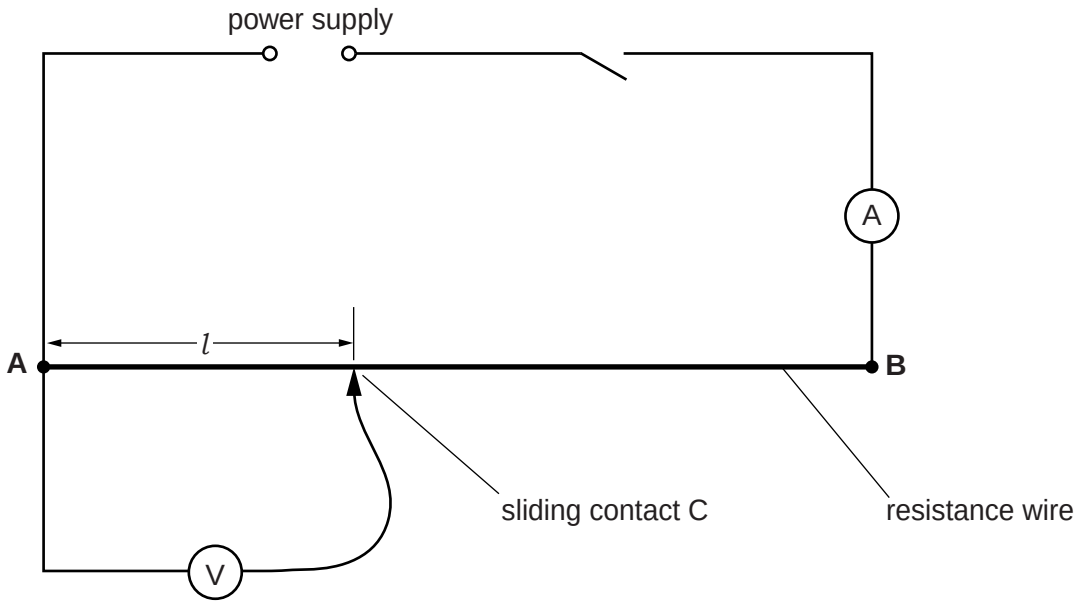


Fig. 3.1

(a) (i) Switch on. Measure and record in Table 3.1 the current I in the circuit and the potential difference V across a length l = 10.0 cm of the wire **AB**. Switch off.

(ii) Calculate the resistance R of 10.0 cm of the wire **AB**, using the equation $R = \frac{V}{I}$. Record this value of R in the table.

(iii) Repeat steps **(i)** and **(ii)** with values of l equal to 20.0 cm, 30.0 cm, 40.0 cm and 50.0 cm.

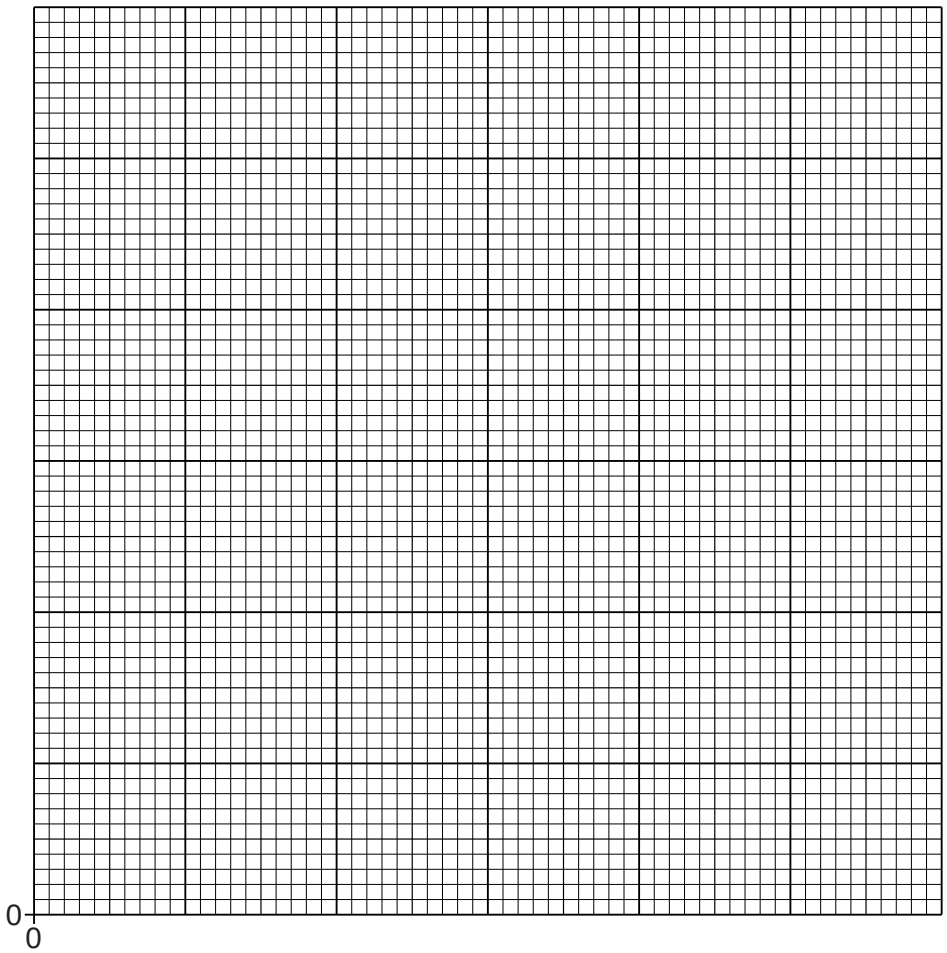
Table 3.1

l/cm	V/V	I/A	R/Ω
10.0			
20.0			
30.0			
40.0			
50.0			

[3]

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



[4]

(c) State whether your graph shows that the resistance R is directly proportional to the length l. Justify your answer by reference to the graph.

statement .....

justification .....

.....

[2]

(d) Suggest how you could further test your statement, in part **(c)**, using the same apparatus. You are not asked to carry out any further practical work.

.....

.....[1]

[Total: 10]

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4 In this experiment, you will determine the magnification of an image produced by a lens.

Carry out the following instructions, referring to Fig. 4.1.

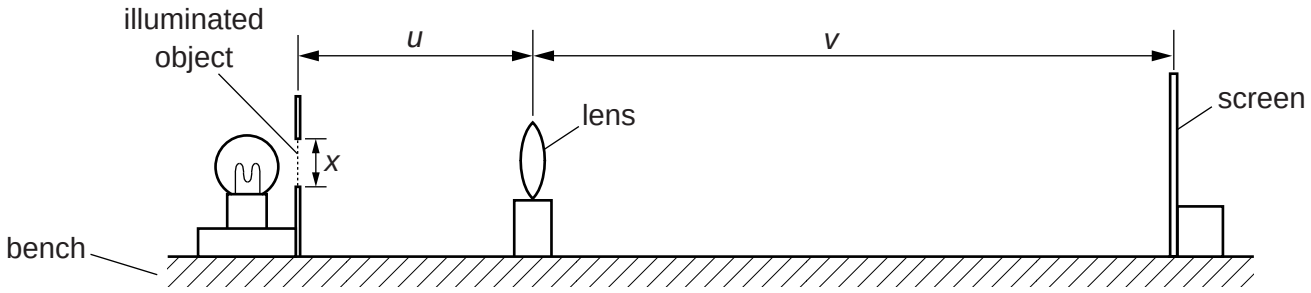


Fig. 4.1

(a) Place the lens a distance u = 20.0 cm from the illuminated object. Move the screen until a sharply focused image of the object is seen on the screen.

(i) Measure and record the distance v from the centre of the lens to the screen.

v = ... cm

(ii) Measure and record the height h from the top to the bottom of the image on the screen.

h = ... cm
[2]

(iii) Sketch a diagram of the image seen on the screen.

[1]

(iv) Switch off the lamp. Measure and record the height x from the top to the bottom of the triangular illuminated object.

x = ... cm

(b) (i) Calculate $\frac{h}{x}$.

$\frac{h}{x}$ = ...

(ii) Calculate $\frac{v}{u}$.

$\frac{v}{u}$ = ...
[3]

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(c) The magnification m of the image is given by the equation $m = \frac{h}{x}$. A student suggests that the ratio $\frac{v}{u}$ also gives the magnification m.

State whether your results support this suggestion. Justify your answer by reference to your results.

statement .....

justification .....

.....

.....

[2]

(d) State two precautions that you could take in this experiment to obtain reliable results.

1. .....

.....

2. .....

.....

[2]

[Total: 10]

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