International General Certificate of Secondary Education
CAMBRIDGE INTERNATIONAL EXAMINATIONS

PHYSICS

PAPER 5 Practical Test

0625/5

OCTOBER/NOVEMBER SESSION 2002

1 hour 15 minutes

Candidates answer on the enclosed answer booklet.
Additional materials:
    As listed in Instructions to Supervisors

TIME   1 hour 15 minutes

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces provided on the answer booklet.

Answer **all** questions.

Write your answers in the spaces provided in the answer booklet.

You are expected to record all your observations as soon as these observations are made. These observations and any arithmetical working of the answers from them should be written in the answer booklet; scrap paper should **not** be used.

An account of the method of carrying out the experiments is **not** required but you should record any precautions you take, and it must be clear (by diagrams or otherwise) how the readings were obtained. The theory of the experiments is **not** required.

At the end of the examination, hand in only the answer booklet.

INFORMATION FOR CANDIDATES

Graph paper is provided in the enclosed answer booklet. Additional sheets of graph paper should be used only if it is necessary to do so.

**This question paper consists of 7 printed pages, 1 blank page
and an inserted answer booklet.**

SP (AT/SLC) S32042/2
© CIE 2002

UNIVERSITY *of* CAMBRIDGE
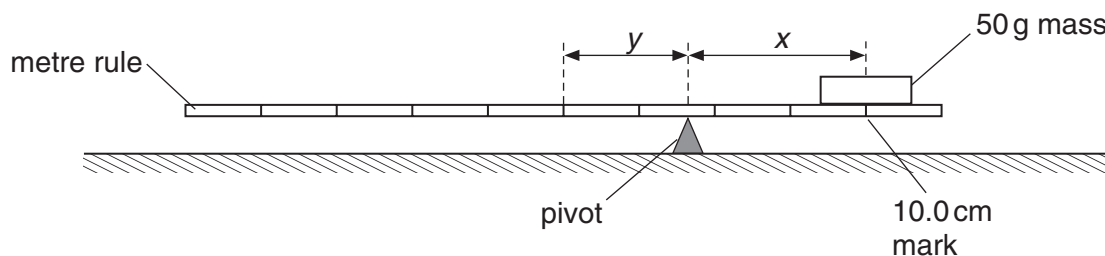Local Examinations Syndicate

[Turn over

Question 1

In this experiment, you are to determine the mass of a metre rule.

Record all of your observations and answers on page 3 of the Answer Booklet.

Carry out the following instructions referring to Fig. 1.1.

Fig. 1.1

(a) Place the 50 g mass on the metre rule so that its centre is directly above the 10.0 cm mark.

(b) Place the rule on the pivot so that the rule is a near as possible to being balanced horizontally.

(c) Measure and record the distance *x* from the centre of the 50 g mass to the pivot and the distance *y* from the centre of the rule to the pivot.

(d) Calculate the mass *m* of the metre rule, using the equation

$$m = \frac{kx}{y}, \text{ where } k = 50 \text{ g.}$$

(e) Describe, with the aid of a diagram, how you judged that the centre of the 50 g mass was directly above the 10.0 cm mark.

(f) Repeat the steps **(a)** to **(c)**, using the 200 g mass.

(g) Calculate and record the new value for *m*, using the equation

$$m = \frac{qx}{y}, \text{ where } q = 200 \text{ g.}$$

(h) Calculate and record the average of the two values for *m*. Show your working.
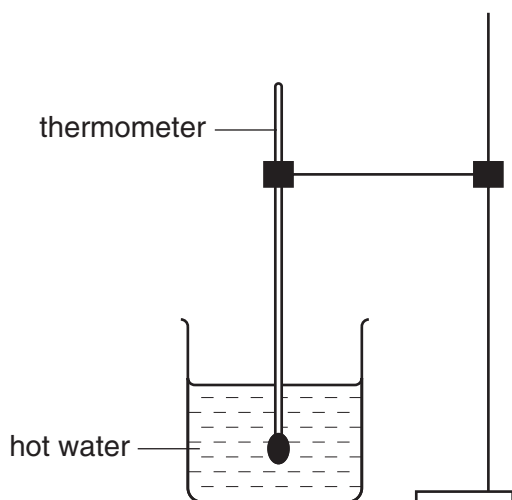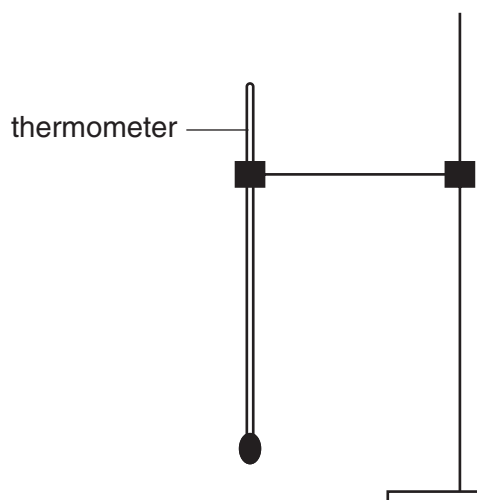
Question 2

In this experiment, you are to investigate the rate of cooling of a thermometer bulb.

Record all of your observations and readings on pages 4 and 5 of the Answer Booklet.

A thermometer is in a beaker of hot water.

Carry out the following instructions referring to Fig. 2.1 and Fig. 2.2.

**Fig. 2.1**   **Fig. 2.2**

(a) When the reading on the thermometer is steady, record the temperature reading. This will be the temperature θ at time $t = 0$. Record this value in the table.

(b) As soon as possible after taking this reading, remove the thermometer from the water and start the stopclock at the same time.

(c) As the thermometer cools, record the thermometer reading every 30 s for 300 s. At time $t = 300$ s, **do not** stop the stopclock.

(d) At time $t = 330$ s, record the thermometer reading and **immediately** put the thermometer back in the hot water.

(e) As the thermometer heats up, record the time and thermometer reading every 30 s for 120 s.

(f) On the graph grid, plot temperature θ/°C (*y*-axis) against time *t*/s (*x*-axis) for times up to 300 s. Draw the best fit curve.

(g) Suggest a conclusion about the rate of cooling of the thermometer bulb compared with the rate of heating. Justify your conclusion by reference to your table of readings.

[Turn over

Question 3

In this experiment, you are to measure the currents through lamps in a circuit.

Record all of your observations and answers on pages 6 and 7 of the Answer Booklet.

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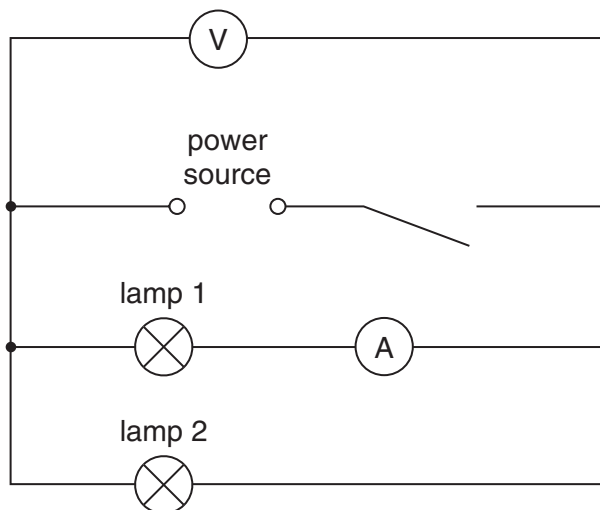
Fig. 3.1

(a) The circuit shown in Fig. 3.1 is set up for you.
Switch on.
Record V, the potential difference across the lamps.
Record I_1, the current through lamp 1.
Switch off.

(b) Rearrange the circuit so that the ammeter is connected in series with lamp 2.
Switch on.
Record I_2, the current through lamp 2.
Switch off.

(c) Calculate I_1/I_2.

(d) The resistance of each lamp can be calculated using the equation $R = V/I$.
Calculate R_1, the resistance of lamp 1, and R_2, the resistance of lamp 2.

(e) Calculate R_2/R_1.

(f) Within the limits of experimental error, compare the values of I_1/I_2 and R_2/R_1.

(g) Fig. 3.2 shows an electrical circuit. Redraw the circuit as a circuit diagram, using standard symbols.

cell

variable resistor

fixed resistor

voltmeter

Fig. 3.2

[Turn over
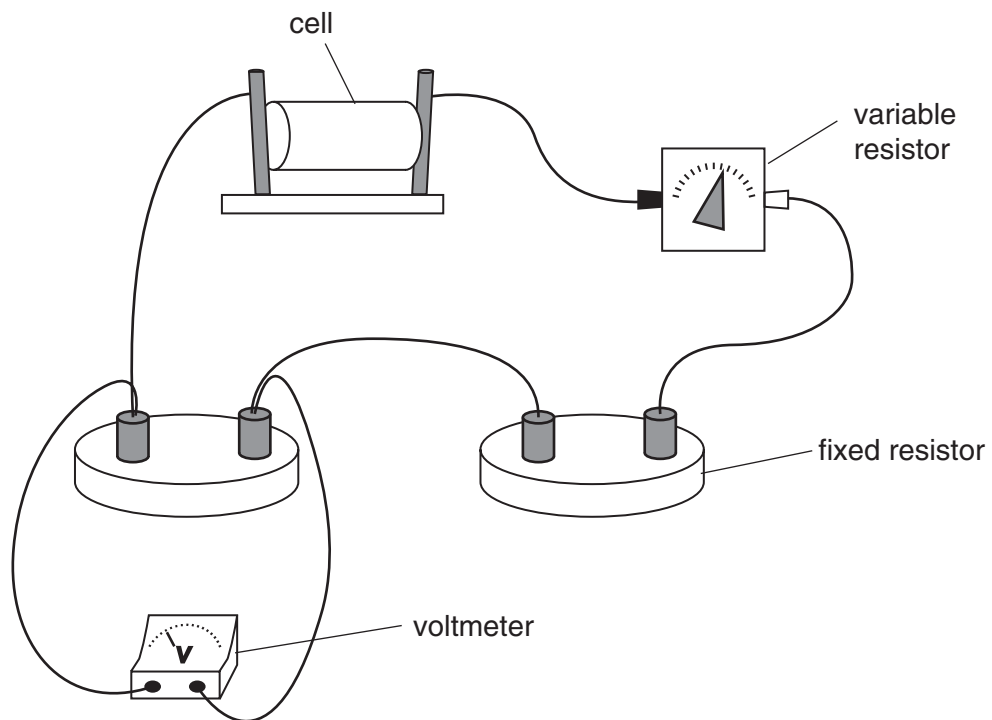
Question 4

In this experiment, you are to determine two values of magnification produced by a converging lens.

Record all of your observations and readings on page 8 of the Answer Booklet.

You have been given an illuminated object, a converging lens mounted in a holder, a screen, and a metre rule.

The illuminated object and the screen have been fixed to the bench; **do not try to change their positions at any time**.

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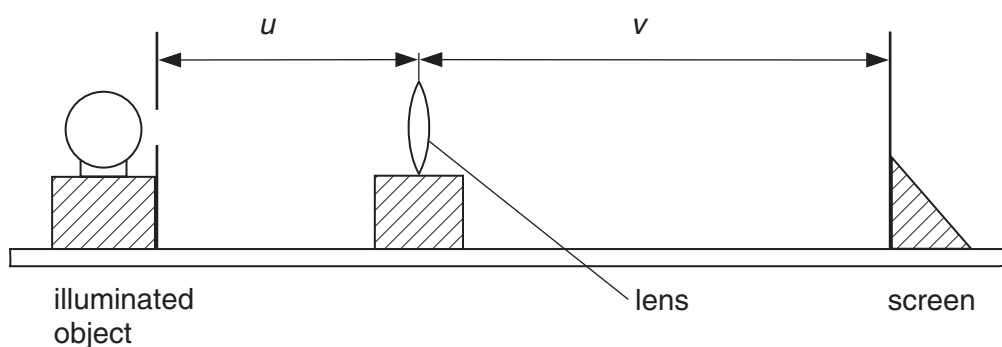
Fig. 4.1

(a) Place the lens between the illuminated object and the screen and about 5 cm away from the illuminated object.

(b) Move the lens slowly towards the screen, making sure that the lens is always in line with the illuminated object and the screen.

(c) When you see a magnified image of the illuminated object on the screen, move the lens very slowly backwards and forwards until the image is sharply focused.

(d) Using the metre rule, measure and record u, the distance from the illuminated object to the centre of the lens.

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

(f) **Without disturbing the apparatus**, measure and record H, the height of the image as shown on Fig. 4.2.
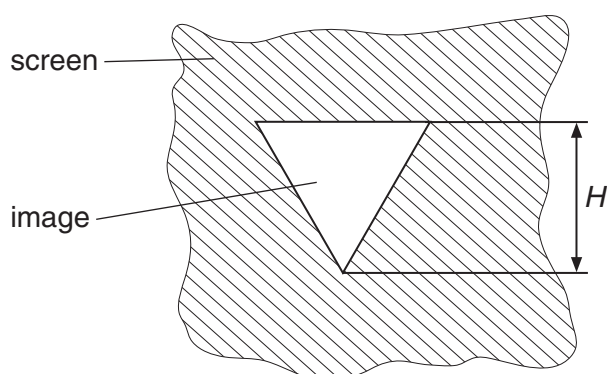
Fig. 4.2

(g) Once again, slowly move the lens towards the screen until you see a smaller image of the illuminated object on the screen. Adjust the position of the lens until the image is sharply focused.

(h) Using the metre rule, measure and record x, the distance from the illuminated object to the centre of the lens as shown on Fig. 4.3.
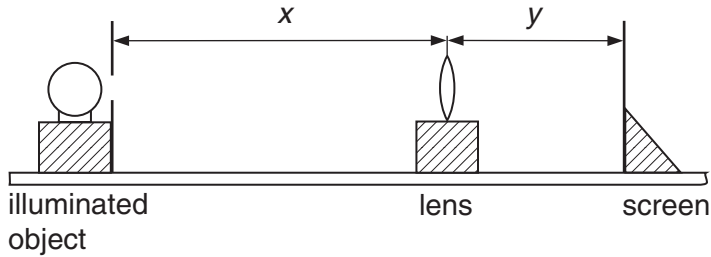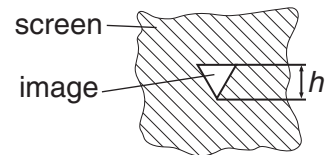
Fig. 4.3   **Fig. 4.4**

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

(j) **Without disturbing the apparatus**, measure and record h, the height of the image as shown on Fig. 4.4.

(k) Calculate the ratios

u/v,

y/x,

H/h.

(l) State and briefly explain one precaution you took in order to obtain reliable measurements.

8

BLANK PAGE

International General Certificate of Secondary Education
CAMBRIDGE INTERNATIONAL EXAMINATIONS

PHYSICS **0625/5**

PAPER 5 Practical Test
ANSWER BOOKLET

OCTOBER/NOVEMBER SESSION 2002
1 hour 15 minutes

TIME   1 hour 15 minutes

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces at the top of this page.
Answer **all** questions.
Write your answers in the spaces provided in this answer booklet.

FOR EXAMINER'S USE	
1	
2	
3	
4	
TOTAL	

This answer booklet consists of 7 printed pages and 1 blank page.

UNIVERSITY *of* CAMBRIDGE
Local Examinations Syndicate

[Turn over

2

BLANK PAGE

1

(c) *x* = ...

 y = ...   [4]

(d) Calculation of *m*

 m = ...   [2]

(e) How you judged that the centre of the 50 g mass was directly above the 10.0 cm mark.

 ....

 ....

 ....[2]

(f) *x* = ...

 y = ...

(g) Calculation of *m*

 m = ...   [3]

(h) Calculation of the average of the two values of *m*

 average *m* value = ...   [4]

[Turn over

2 **(a)–(e)**

time *t*/s	temperature θ/°C
0	
30	
60	
90	
120	
150	
180	
210	
240	
270	
300	
330	
360	
390	
420	
450	

[4]

(g) Conclusion

....

....[1]

Justification

....

....

....

....[2]

(f)

time / s

[8]

[Turn over
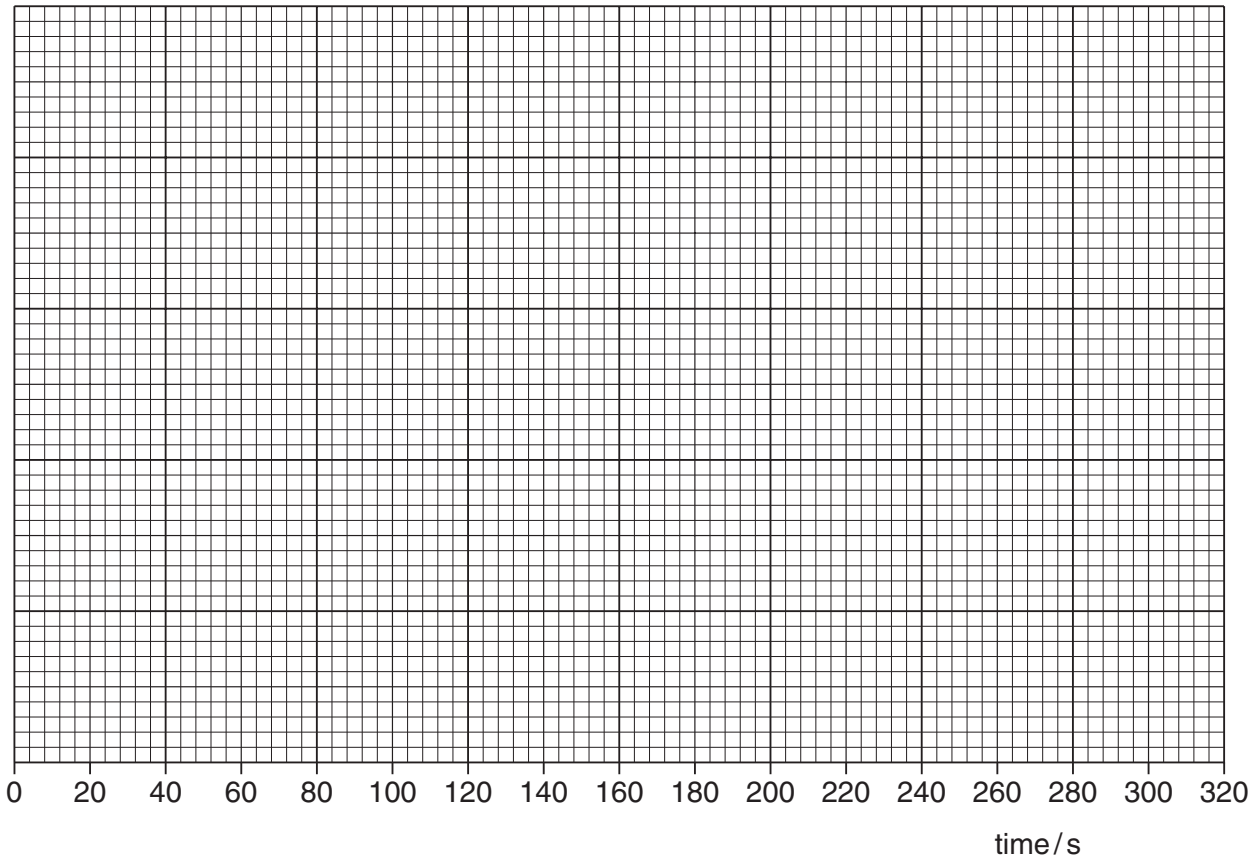
3 **(a)** $V =$ ....

   $I_1 =$ ....

(b) $I_2 =$ .... [3]

(c) Calculation of I_1/I_2

   $I_1/I_2 =$ .... [3]

(d) Calculation of R_1

   $R_1 =$ ....

   Calculation of R_2

   $R_2 =$ .... [2]

(e) Calculation of R_2/R_1

   $R_2/R_1 =$ .... [2]

(f) Within the limits of experimental error, the values of I_1/I_2 and R_2/R_1 are

   ....[2]

(g) Circuit diagram

[3]

[Turn over

4

(d) Record of *u* ....

(e) Record of *v* ....

(f) Record of *H* ....   [5]

(h) Record of *x* ....

(i) Record of *y* ....

(j) Record of *h* ....   [3]

(k) Calculation of *u/v*

u/v = ...

Calculation of *y/x*

y/x = ...

Calculation of *H/h*

H/h = ...   [5]

(l) Precaution

....

....

....[2]