



**Cambridge International Examinations**  
Cambridge International General Certificate of Secondary Education

CANDIDATE  
NAME

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NUMBER

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**PHYSICS**

**0625/52**

Paper 5 Practical Test

**May/June 2015**

**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.

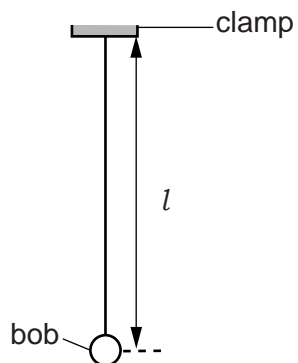
For Examiner's Use	
1	
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The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

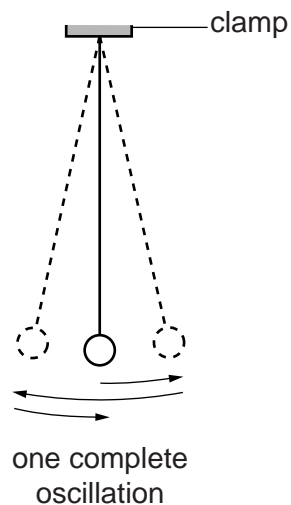
This document consists of **10** printed pages and **2** blank pages.

- 1 In this experiment, you will investigate a pendulum.

Carry out the following instructions referring to Figs. 1.1 and 1.2.



**Fig. 1.1**



**Fig. 1.2**

A pendulum has been set up for you.

- (a) Adjust the pendulum until its length  $l = 50.0$  cm. The length  $l$  is measured to the centre of the bob.

State one precaution that you took to measure the length  $l$  as accurately as possible. You may draw a diagram.

.....  
 .....[1]

## 3

- (b) (i) Displace the pendulum bob slightly and release it so that it swings. Measure the time  $t$  for 20 complete oscillations of the pendulum (see Fig. 1.2).

$t = \dots\dots\dots$  [1]

- (ii) Calculate the period  $T$  of the pendulum. The period is the time for one complete oscillation.

$T = \dots\dots\dots$  [1]

- (iii) Explain why measuring the time for 20 oscillations, rather than for 1 oscillation, gives a more accurate value for  $T$ .

.....  
 ..... [1]

- (c) Adjust the length of the pendulum until its length  $l = 100.0$  cm. Repeat steps (b)(i) and (b)(ii).

$t = \dots\dots\dots$

$T = \dots\dots\dots$   
 [2]

- (d) A student suggests that doubling the length  $l$  of the pendulum should double the period  $T$ .

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

statement .....  
 justification .....  
 ..... [2]

- (e) To continue the investigation of the relationship between the length  $l$  of the pendulum and the period  $T$ , it is necessary to use a range of values of length  $l$ .

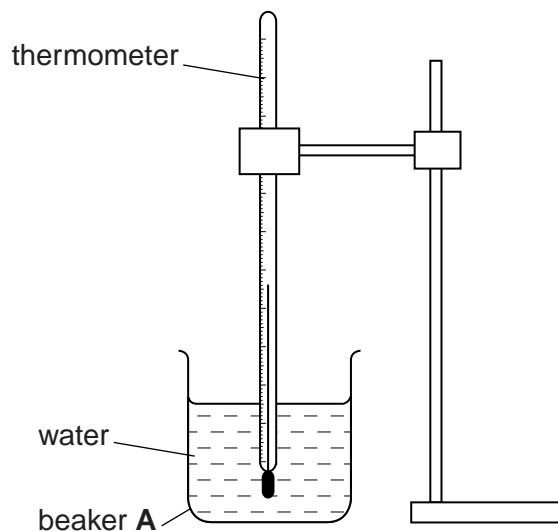
List additional  $l$  values that you would plan to use in the laboratory. You are not asked to make any more measurements.

..... [2]

[Total: 10]

2 In this experiment, you will investigate the cooling of water.

Carry out the following instructions referring to Fig. 2.1.



**Fig. 2.1**

(a) Pour  $100\text{cm}^3$  of hot water into beaker **A**. Place the thermometer in beaker **A**, as shown in Fig. 2.1.

(i) Record the temperature  $\theta_H$  of the hot water in beaker **A**.

$$\theta_H = \dots\dots\dots [1]$$

(ii) State one precaution that you took to ensure that the temperature reading for the hot water is as reliable as possible.

.....  
 ..... [1]

(b) (i) Add  $50\text{cm}^3$  of cold water to the hot water in beaker **A**. Stir briefly. Record the temperature  $\theta_1$ .

$$\theta_1 = \dots\dots\dots$$

(ii) Calculate the decrease in temperature  $\theta_A$  using the equation  $\theta_A = (\theta_H - \theta_1)$ .

$$\theta_A = \dots\dots\dots [2]$$

(c) (i) Add a further  $100\text{cm}^3$  of cold water to the water in beaker **A**. Stir briefly. Record the temperature  $\theta_2$ .

$$\theta_2 = \dots\dots\dots$$

(ii) Calculate the decrease in temperature  $\theta_B$  using the equation  $\theta_B = (\theta_1 - \theta_2)$ .

$$\theta_B = \dots\dots\dots [2]$$

(d) Suggest two factors, other than the volume and temperature of the cold water added, that affect the decrease in temperature of the hot water.

1. ....

.....

2. ....

.....

[2]

(e) Describe briefly how a measuring cylinder is read to obtain an accurate value for the volume of water. You may draw a diagram.

.....

.....

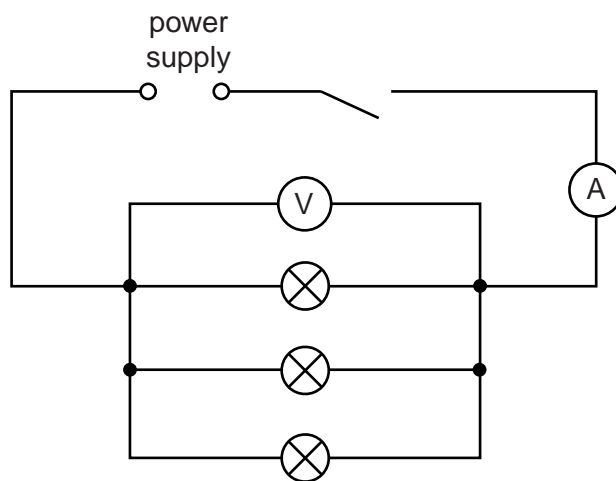
.....

..... [2]

[Total: 10]

- 3 In this experiment, you will investigate the resistance of lamps.

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



**Fig. 3.1**

- (a) (i) Switch on. Measure and record the potential difference  $V_p$  across the lamps and the current  $I_p$  in the circuit. Switch off.

$$V_p = \dots\dots\dots$$

$$I_p = \dots\dots\dots [2]$$

- (ii) Calculate the combined resistance  $R_p$  of the lamps using the equation  $R_p = \frac{V_p}{I_p}$ .

$$R_p = \dots\dots\dots [1]$$

**(b)** Disconnect and remove one of the lamps.

The remaining components are to be arranged to make a circuit in which

- the two lamps are in series
- the ammeter will measure the total current in the circuit
- the voltmeter will measure the potential difference across both lamps.

In the space below, draw a diagram of this circuit using standard circuit symbols.

[2]

**(c)** Set up the circuit as described in **(b)**.

- (i)** Switch on. Measure and record the potential difference  $V_S$  across the two lamps and the current  $I_S$  in the circuit. Switch off.

$V_S =$  .....

$I_S =$  .....

[1]

- (ii)** Calculate the resistance  $R_S$  of the lamps using the equation  $R_S = \frac{V_S}{I_S}$ .

$R_S =$  ..... [2]

**(d) (i)** A student wishes to vary the current in the circuit in Fig. 3.1, using a variable resistor.

In the space below, draw the standard circuit symbol for a variable resistor.

[1]

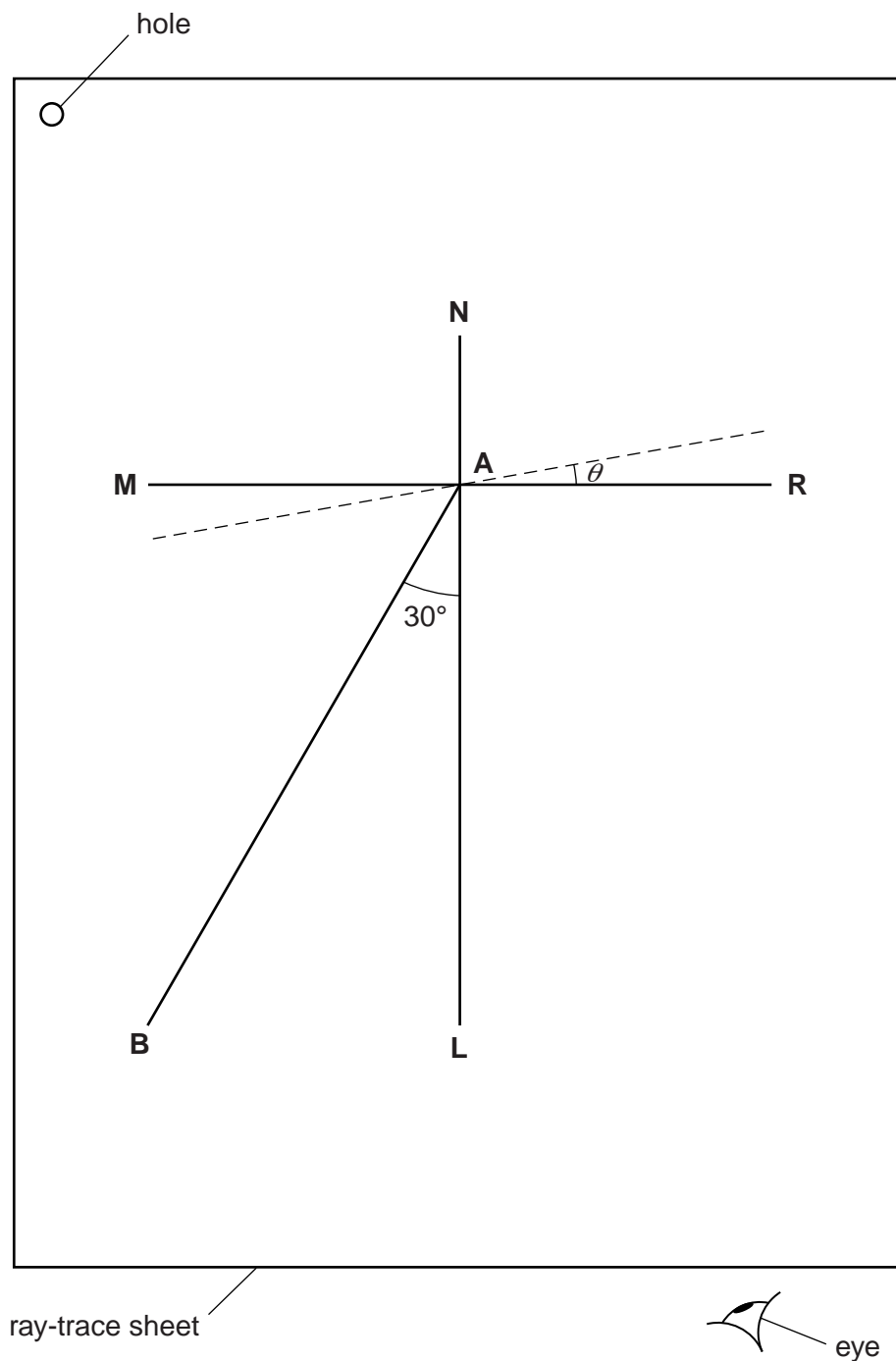
- (ii)** On Fig. 3.1, label with X a suitable position in the circuit for a variable resistor used to vary the current in all the lamps. [1]

[Total: 10]

**[Turn over**

4 In this experiment, you will investigate reflection using a plane mirror.

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



**Fig. 4.1**

- (a) Draw a line 10 cm long near the middle of the blank ray-trace sheet supplied. Label the line **MR**. Draw a normal to this line that passes through its centre. Label the normal **NL**. Label the point at which **NL** crosses **MR** with the letter **A**.
- (b) Draw a line 8 cm long from **A** at an angle of incidence  $i = 30^\circ$  to the normal, below **MR** and to the left of the normal. Label the end of this line **B**.
- (c) Place the reflecting face of the mirror vertically on the line **MR**.



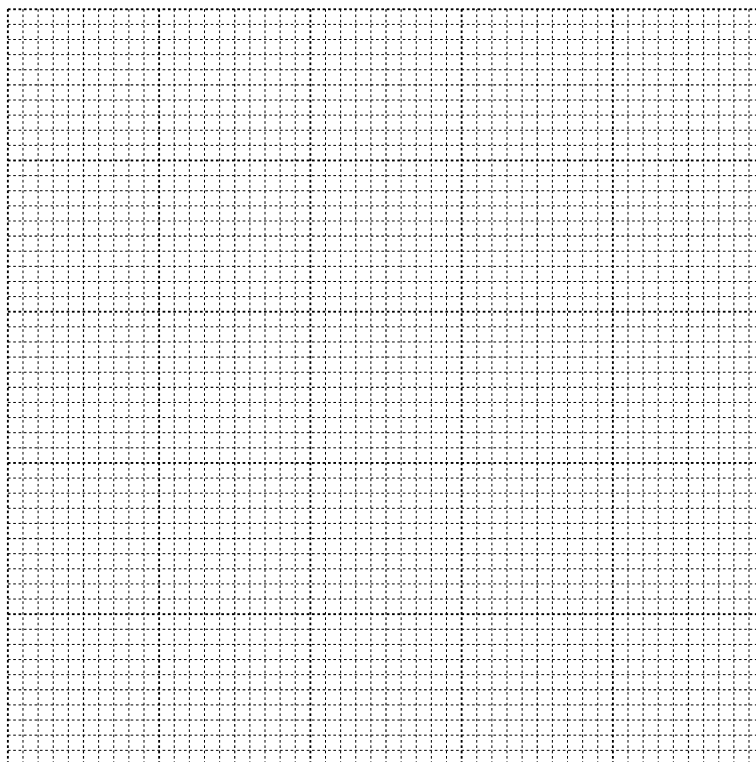
- (d) Place two pins  $P_1$  and  $P_2$  on line **AB** a suitable distance apart.
- (e) View the images of pins  $P_1$  and  $P_2$  from the direction indicated by the eye in Fig. 4.1. Place two pins  $P_3$  and  $P_4$ , some distance apart, so that pins  $P_3$  and  $P_4$ , and the images of  $P_1$  and  $P_2$ , all appear exactly one behind the other. Label the positions of  $P_3$  and  $P_4$ .
- (f) Remove pins  $P_3$  and  $P_4$  and the mirror. Draw the line joining the positions of  $P_3$  and  $P_4$ . Extend the line until it meets **NL**.
- (g) Measure, and record in Table 4.1, the angle  $\alpha$  between **NL** and the line joining the positions of  $P_3$  and  $P_4$ . At this stage the angle  $\theta$  between the mirror and line **MR** is  $0^\circ$ , as shown in the table.
- (h) Remove pins  $P_1$  and  $P_2$ . Draw lines at angles  $\theta = 10^\circ$ ,  $20^\circ$  and  $30^\circ$  to **MR**, one of which is shown in Fig. 4.1. Repeat steps (d) to (g), placing the mirror on each of the new lines in turn, so that you obtain four sets of readings.

Table 4.1

$\theta/^\circ$	$\alpha/^\circ$
0	
10	
20	
30	

[1]

- (i) Plot a graph of  $\alpha/^\circ$  ( $y$ -axis) against  $\theta/^\circ$  ( $x$ -axis).



[4]

## 10

- (j) State whether your graph line shows that the angle  $\alpha$  is directly proportional to the angle  $\theta$ . Justify your statement by reference to your graph line.

statement .....

justification .....

..... [2]

**Tie your ray-trace sheet into this Booklet between pages 10 and 11.** [3]

[Total: 10]



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