Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME	

CENTRE NUMBER		CANDIDATE NUMBER	

3908655948

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	
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 **10** printed pages and **2** blank pages.

DC (CW/JG) 91127/2

CAMBRIDGE International Examinations

1 In this experiment, you will investigate a pendulum.

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

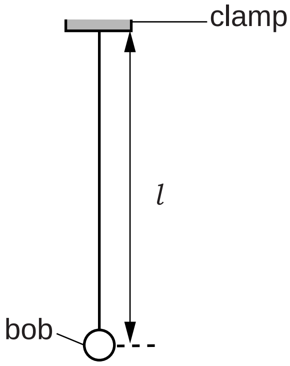

Fig. 1.1

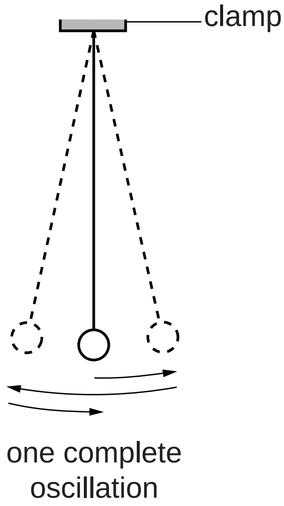

Fig. 1.2

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]

(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 = ... [1]

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

T = ...[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 = ...

T = ...

[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.

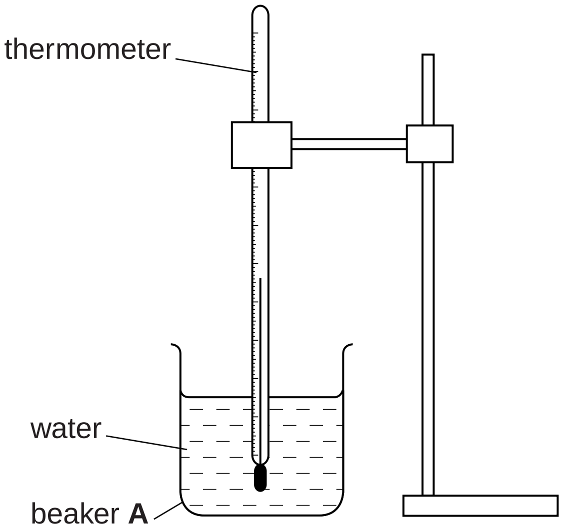

Fig. 2.1

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

(i) Record the temperature θ_H of the hot water in beaker **A**.

θ_H = ...[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 cm^3 of cold water to the hot water in beaker **A**. Stir briefly. Record the temperature θ_1.

θ_1 = ...

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

θ_A = ...
[2]

(c) (i) Add a further 100 cm^3 of cold water to the water in beaker **A**. Stir briefly. Record the temperature θ_2.

θ_2 = ...

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

θ_B = ...
[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.

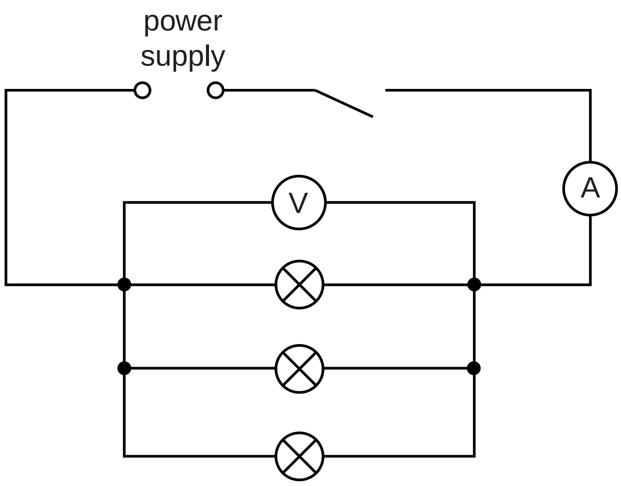

Fig. 3.1

(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 = ...

I_P = ...
[2]

(ii) Calculate the combined resistance R_P of the lamps using the equation $R_P = \frac{V_P}{I_P}$.

R_P = ...[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]

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

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

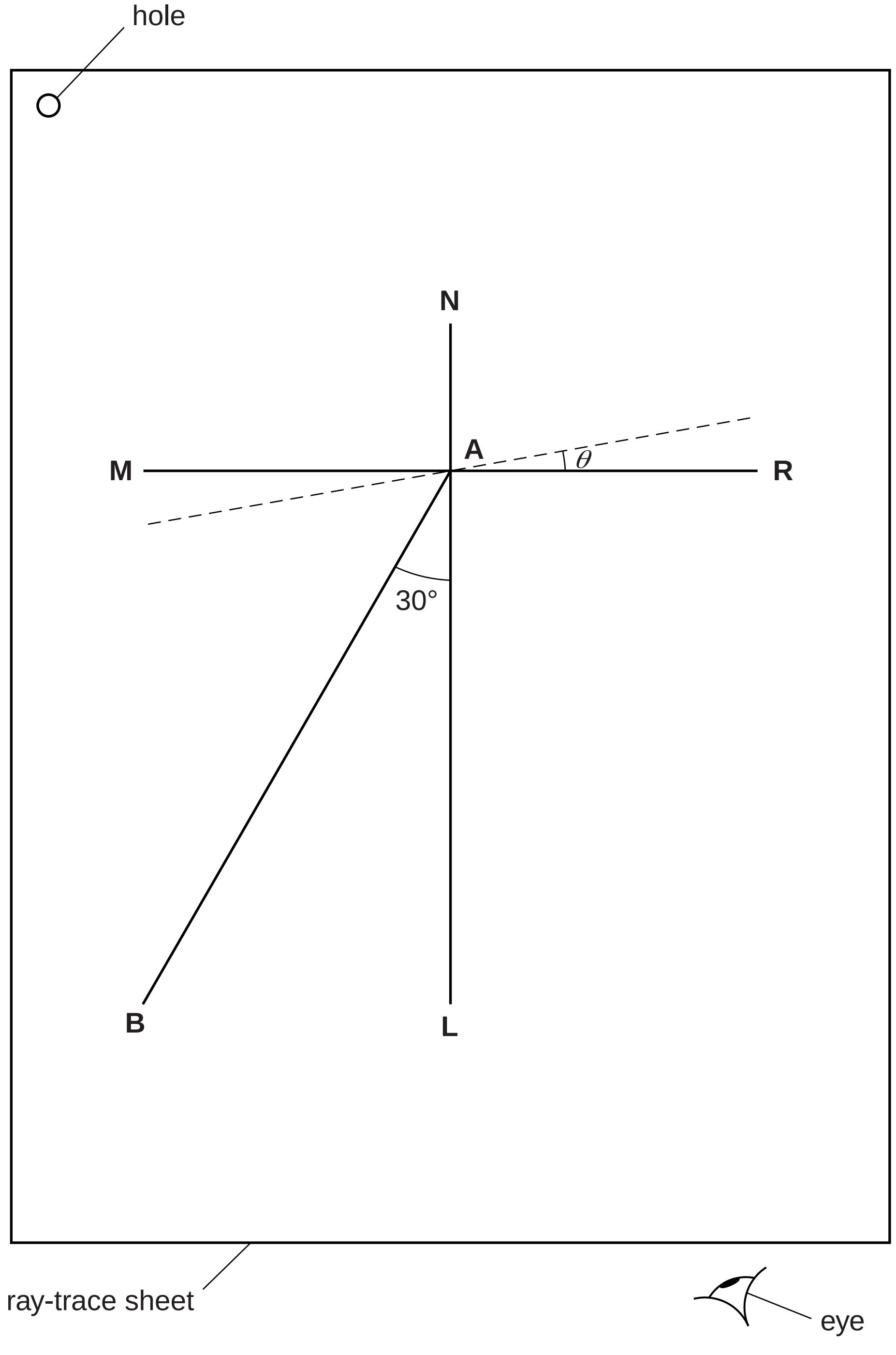

Fig. 4.1

(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° 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 α between **NL** and the line joining the positions of P_3 and P_4. At this stage the angle θ between the mirror and line **MR** is 0°, as shown in the table.

(h) Remove pins P_1 and P_2. Draw lines at angles θ = 10°, 20° and 30° 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

θ / °	α / °
0	
10	
20	
30	

[1]

(i) Plot a graph of α / ° (*y*-axis) against θ / ° (*x*-axis).

[4]

(j) State whether your graph line shows that the angle α is directly proportional to the angle θ. 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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