Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME				
CENTRE NUMBER			CANDIDATE NUMBER	

3777296667

PHYSICS **0625/51**

Paper 5 Practical Test **October/November 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 **12** printed pages.

DC (LK/CGW) 95682/2

CAMBRIDGE International Examinations

1 In this experiment, you will investigate two different types of pendulum.

Carry out the following instructions, referring to Figs. 1.1, 1.2 and 1.3.

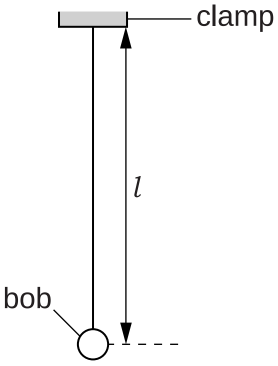


Fig. 1.1

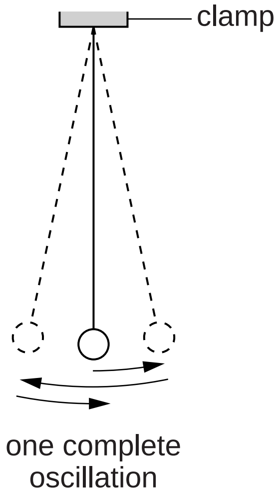


Fig. 1.2

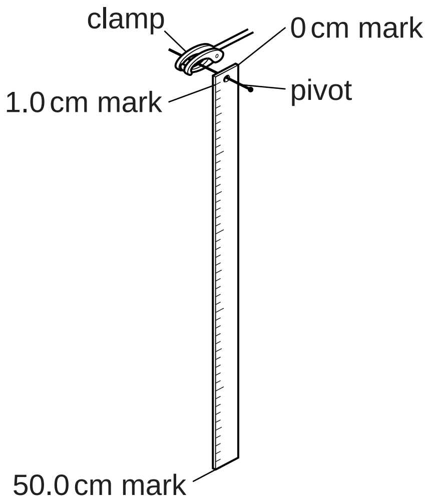


Fig. 1.3

A pendulum has been set up for you as shown in Fig. 1.1.

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

Explain briefly how you measured the length l as accurately as possible.

....

....

....[1]

(b) **(i)** Displace the pendulum bob slightly and release it so that it swings.

Measure the time t_S for 20 complete oscillations of the pendulum (see Fig. 1.2).

t_S = ...[1]

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

T_S = ...[2]

(iii) Explain why measuring the time for 20 swings, rather than for 1 swing, gives a more accurate value for T_S.

....

....

....[1]

(c) The pendulum shown in Fig. 1.3 is a solid strip of length 50.0 cm. It has been set up for you.

(i) Displace this pendulum slightly and release it so that it swings.

Measure the time t_C for 20 complete oscillations of the pendulum.

t_C = ...

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

T_C = ...
[2]

(d) A student suggests that T_C should be equal to T_S.

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

statement ....

justification ....

....

....
[2]

(e) Assume that the length l of the first pendulum has been measured accurately and that the length of the strip that forms the second pendulum is exactly 50.0 cm long.

Suggest why it may not be fair to state that both pendulums have the same length l = 50.0 cm.

....

....[1]

[Total: 10]

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

(a) Measure the temperature θ_R of the water in beaker **A**.

θ_R = ...[1]

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

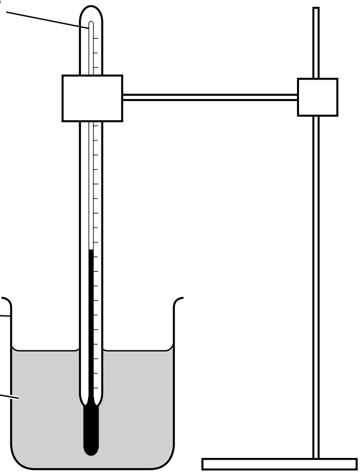


Fig. 2.1

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

θ_H = ...[1]

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

....

....[1]

(c) Add the water from beaker **A** to the hot water in beaker **B**. Stir briefly. Record the temperature θ_M.

θ_M = ...[1]

(d) Calculate the average temperature θ_A of the hot water and the cold water using the equation $\theta_A = \frac{(\theta_H + \theta_R)}{2}$.

θ_A = ...[2]

(e) A student carefully carries out this experiment and finds that θ_M is less than θ_A.

He was expecting that the temperature θ_M of the mixture would be the same as the average temperature θ_A of the hot water and cold water.

Suggest two factors that could cause θ_M and θ_A to be different.

1. ....

....

2. ....

....

....
[2]

(f) Fig. 2.2 shows a measuring cylinder.

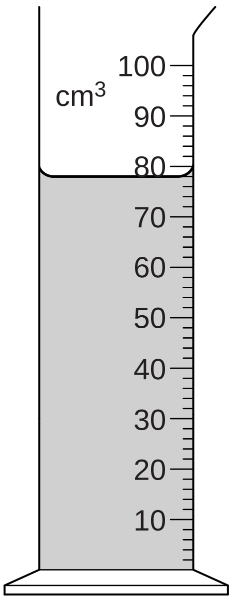


Fig. 2.2

Three students take the volume reading. Their readings are:

- Student 1: 80 cm^3
- Student 2: 79 cm^3
- Student 3: 78 cm^3

(i) State the correct reading.

correct reading = ...

(ii) Explain briefly the mistake made by **one** of the other students.

Student .... is incorrect, because ....

....
[2]

[Total: 10]

3 In this experiment, you will determine the resistance of a resistor.

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

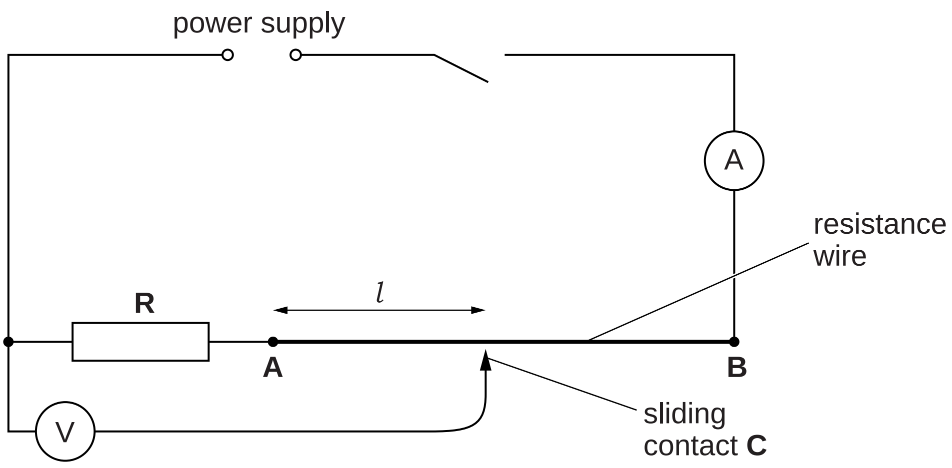


Fig. 3.1

(a) (i) Switch on. Measure the current I in the circuit.

I = ...[1]

(ii) Place the sliding contact **C** at a distance l = 20.0 cm from **A**.

Measure, and record in Table 3.1, the reading on the voltmeter.

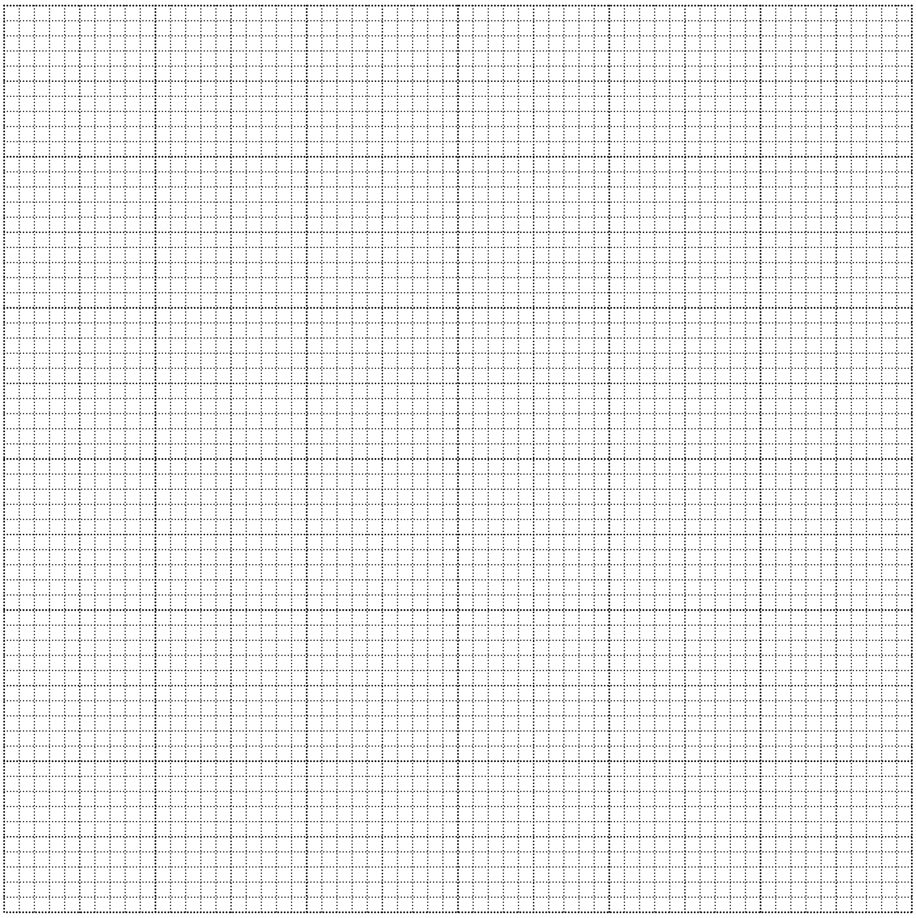
(iii) Repeat the procedure in **(ii)** using l values of 40.0 cm, 60.0 cm, 80.0 cm and 100.0 cm. Switch off.

Table 3.1

l/cm	V/V
20.0	
40.0	
60.0	
80.0	
100.0	

[1]

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



[5]

(c) **(i)** Determine the value of the intercept Y on the y-axis.

Y = ...[1]

(ii) Calculate the ratio $\frac{Y}{I}$. The value of I is your answer to part **(a)(i)**.

$\frac{Y}{I}$ = ...

(iii) $\frac{Y}{I}$ is numerically equal to the resistance R of the resistor **R**.

Write down a value for R to a suitable number of significant figures for this experiment. Include the unit.

R = ...
[2]

[Total: 10]

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

Carry out the following instructions, using the separate ray-trace sheet provided. You may refer to Fig. 4.1 for guidance.

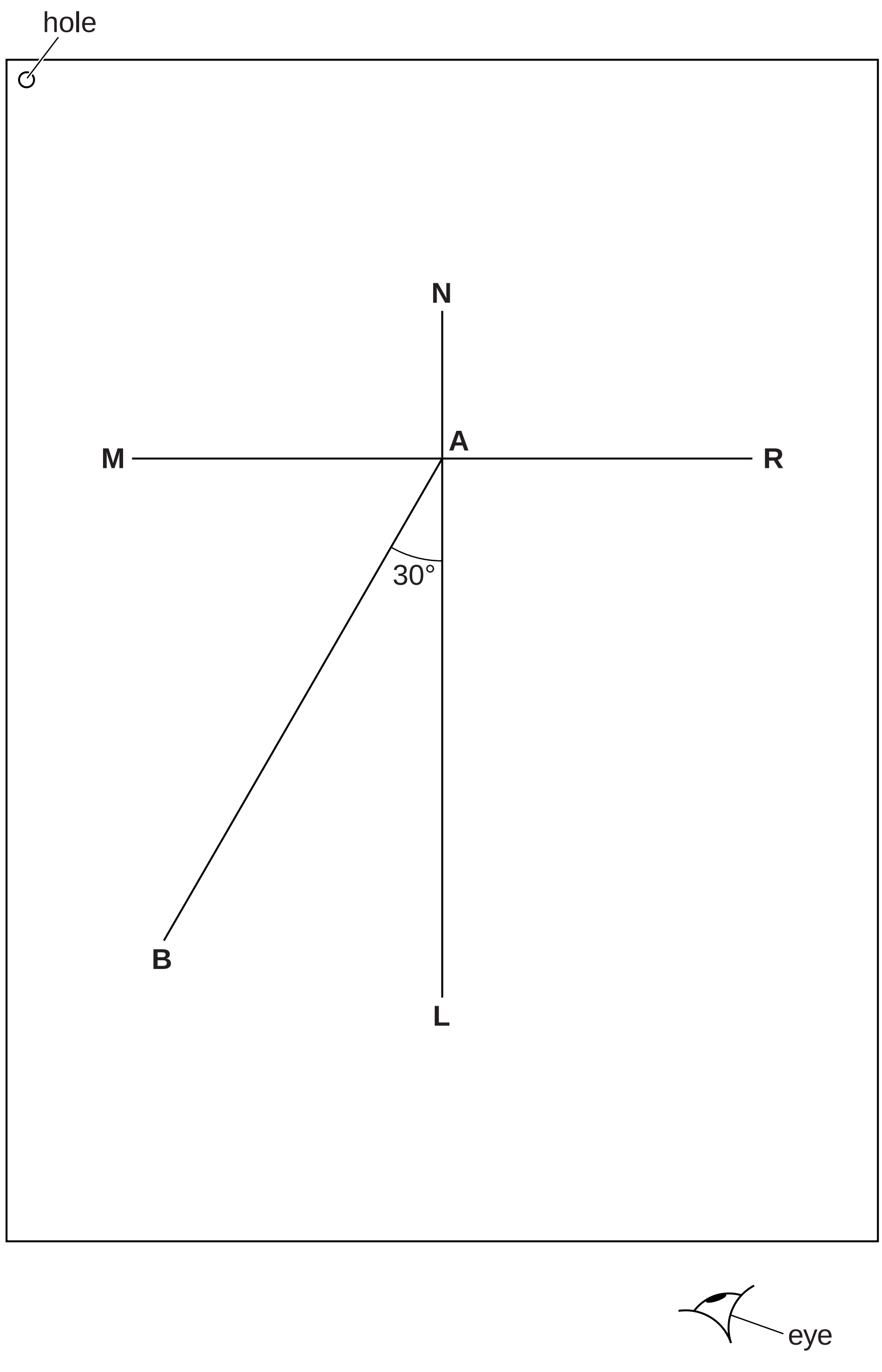


Fig. 4.1

(a) Draw a line 10.0 cm long near the middle of your ray-trace sheet. 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 8.0 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 a pin P_1 at point **B**, 8.0 cm from the point **A**.

(e) Place pin P_2 on line **AB** a suitable distance from pin P_1.

(f) 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, a suitable distance apart, so that pins P_3 and P_4, and the images of P_2 and P_1, all appear exactly one behind the other. Label the positions of P_3 and P_4.

(g) Remove the pins and the mirror. Draw the line joining the positions of P_3 and P_4. Extend the line until it meets **NL**.

(h) Measure, and record in Table 4.1, the angle *r* between **NL** and the line joining the positions of P_3 and P_4.

Table 4.1

i / °	*r* / °
30	

[2]

(i) Draw a second normal to line **MR**, 2.0 cm to the right of **NL**. Label the normal **XY**. Label the point at which **XY** crosses **MR** with the letter **C**. Draw the line **BC**. Measure, and record in the table, the angle *i* between **BC** and **XY**.

(j) Place pin P_1 at point **B**. Place pin P_2 on line **BC** a suitable distance from pin P_1.

(k) Repeat the procedure in parts **(f)** and **(g)** using the new normal **XY**.

(l) Measure, and record in the table, the angle *r* between **XY** and the line joining the new positions of P_3 and P_4.

(m) State two precautions that you took in this experiment in order to obtain reliable readings.

1. ....

....

2. ....

....

[2]

(n) A student has done this experiment very carefully, taking these precautions.

She is disappointed to find that her lines for the reflected rays are not exactly where she predicts from the theory.

Suggest a practical reason for this.

....[1]

Tie your ray-trace sheet into this Booklet between pages 10 and 11. [5]

[Total: 10]