Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME	

CENTRE NUMBER						CANDIDATE NUMBER					

2367719586

PHYSICS **0625/52**

Paper 5 Practical Test **May/June 2020**

1 hour 15 minutes

You must answer on the question paper.

You will need: The materials and apparatus listed in the confidential instructions

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- You should show all your working and use appropriate units.

INFORMATION

- The total mark for this paper is 40.
- The number of marks for each question or part question is shown in brackets [ ].

For Examiner's Use	
1	
2	
3	
4	
Total	

This document has **12** pages. Blank pages are indicated.

DC (LK/SW) 195014/2

1 In this experiment, you will investigate the period of a pendulum. Carry out the following instructions, referring to Fig. 1.1 and Fig. 1.2.

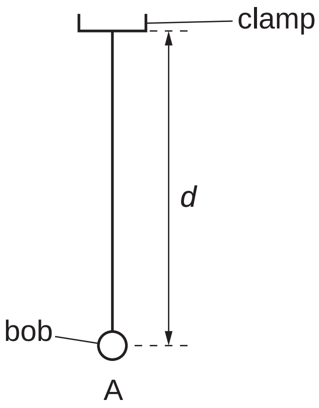

Fig. 1.1

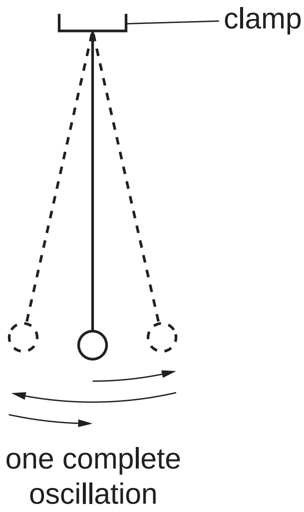

Fig. 1.2

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

(a) Adjust the length of the pendulum until the distance *d* measured from the bottom of the clamp to the centre of the bob is 50.0 cm.

Explain how you used the metre rule and set square to measure the length *d* as accurately as possible. You may draw a diagram.

....

.... [1]

(b) Displace the bob slightly and release it so that it swings. Fig. 1.2 shows one complete oscillation of the pendulum.

(i) Measure the time t_1 for 10 complete oscillations.

t_1 = ... [1]

(ii) Calculate the period T_1 of the pendulum. The period is the time for one complete oscillation.

T_1 = ... [1]

(c) Adjust the pendulum until the distance d is 100.0 cm.

Repeat the procedure in **(b)**.

t_2 = ...

T_2 = ...
[2]

(d) Remove the pendulum from the clamp. Using the balance provided, measure the mass m_A of the pendulum. The mass includes the pendulum bob and the thread.

m_A = ... g [1]

(e) Using the balance, measure the mass m_B of pendulum B.

m_B = ... g [1]

(f) Hang pendulum B from the clamp. Adjust the length of the pendulum until the distance *d* is 50.0 cm.

(i) Repeat the procedure in **(b)** and **(c)**.

Distance *d* = 50.0 cm:

t_3 = ...

T_3 = ...

Distance *d* = 100.0 cm:

t_4 = ...

T_4 = ...
[1]

(ii) Explain briefly why timing 10 oscillations gives a more accurate result for the period *T* than timing 1 oscillation.

....

.... [1]

(g) **(i)** Using the results T_1, T_2, T_3 and T_4, for the period of each pendulum set up, tick (✓) the response that matches your results within the limits of experimental accuracy.

☐ the period *T* is affected by *d* only

☐ the period *T* is affected by both *d* and *m*

☐ the period *T* is affected by *m* only

☐ the period *T* is not affected by *d* or *m*

[1]

(ii) Justify your answer to **(g)(i)** by reference to your results.

....

.... [1]

[Total: 11]

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2 In this experiment, you will investigate how the potential difference across a resistance wire varies with the length of the wire.

Carry out the following instructions, referring to Fig. 2.1.

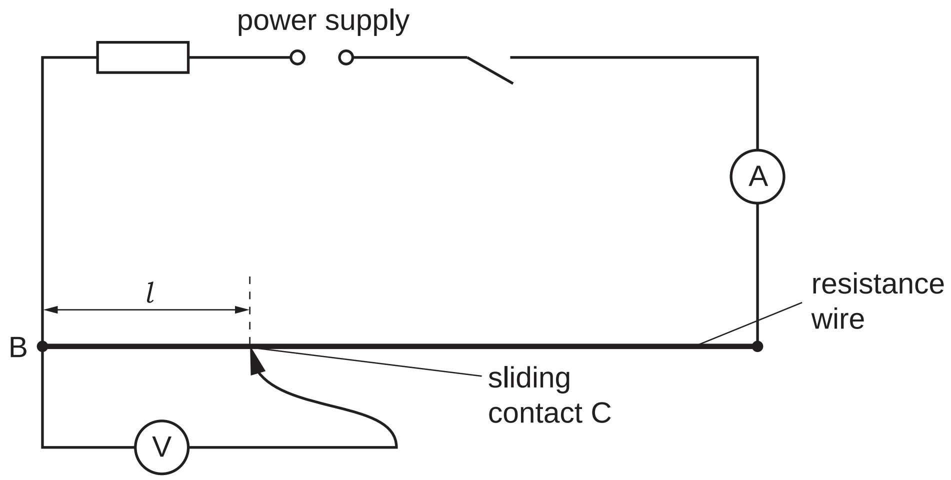


Fig. 2.1

(a)

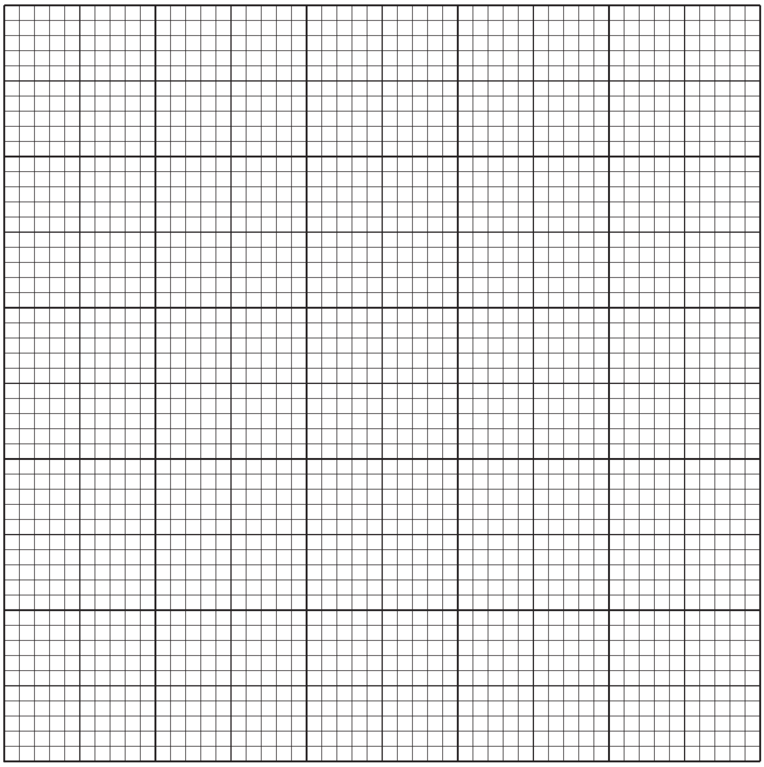
- Switch on.
- Place the sliding contact C on the resistance wire at a distance l = 10.0 cm from B.
- Measure, and record in Table 2.1, the potential difference V across the length l of the resistance wire.
- Measure, and record in Table 2.1, the current I in the circuit.
- Repeat the procedure using l = 30.0 cm, 50.0 cm, 70.0 cm and 90.0 cm.
- Switch off.

Table 2.1

l/cm	V/V	I/A
10.0		
30.0		
50.0		
70.0		
90.0		

[3]

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



[4]

(c) **(i)** Write a conclusion about the value of the current I in the circuit as the position of the sliding contact C is changed.

....

.... [1]

(ii) Justify your conclusion by reference to your results.

....

.... [1]

(d) Using the graph, determine the potential difference V_L when the length l = 60.0 cm.

Show clearly on the graph how you obtained your result.

V_L = ... [2]

[Total: 11]

3 In this experiment, you will investigate some thermal properties of sand and water.

Carry out the following instructions referring to Fig. 3.1.

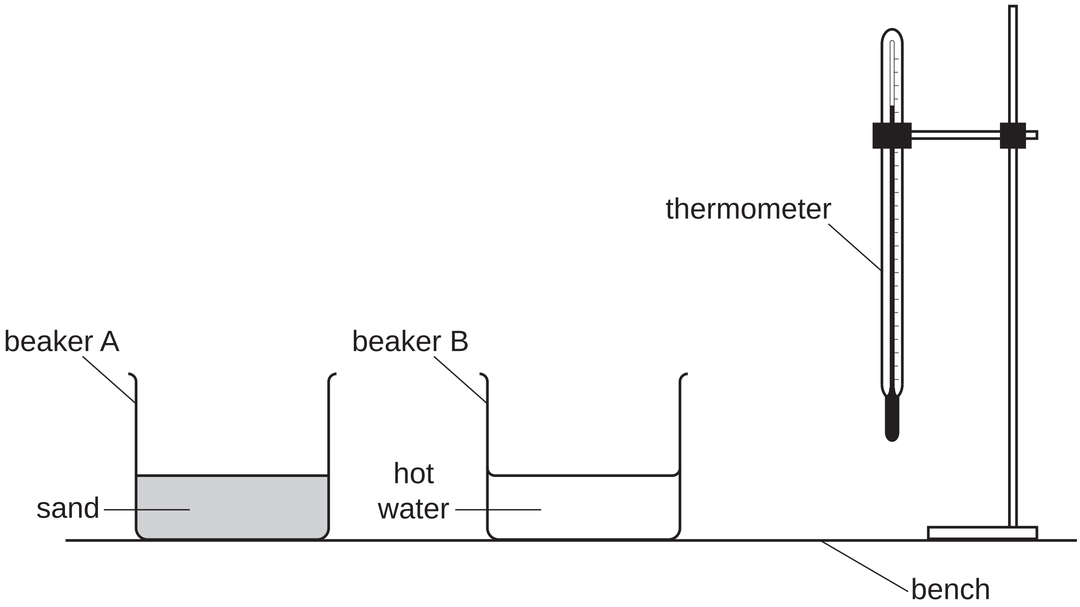


Fig. 3.1

(a) Use the thermometer to measure room temperature θ_S.

θ_S = ...

Use the thermometer to measure the temperature θ_H of the hot water in beaker B.

θ_H = ...
[1]

(b) Beaker A contains sand. Pour 100 cm^3 of hot water from beaker B into beaker A. Carefully stir the water and sand mixture.

Record the highest temperature θ_M of the mixture.

θ_M = ... [1]

(c) **(i)** Calculate the rise in temperature θ_R of the sand using the equation $\theta_R = (\theta_M - \theta_S)$.

θ_R = ...

Calculate the fall in temperature θ_F of the hot water using the equation $\theta_F = (\theta_H - \theta_M)$.

θ_F = ... [1]

(ii) Calculate the ratio S using the equation $S = \frac{\theta_R}{\theta_F}$.

S = ... [1]

(d) Measure the new temperature θ_H of the hot water supplied.

θ_H = ... [1]

(e) Beaker C contains water at room temperature. Pour 100 cm^3 of the hot water into beaker C. Carefully stir the water.

Record the highest temperature θ_M of the mixture.

θ_M = ... [1]

(f) Calculate the rise in temperature θ_R of the cold water using the equation $\theta_R = (\theta_M - \theta_S)$. Use the value of room temperature θ_S recorded in **(a)** and the value of θ_M recorded in **(e)**.

θ_R = ...

Calculate the fall in temperature θ_F of the hot water using the equation $\theta_F = (\theta_H - \theta_M)$. Use the value of θ_H from **(d)** and θ_M from **(e)**.

θ_F = ...

Calculate the ratio W using the equation $W = \frac{\theta_R}{\theta_F}$.

W = ...
[1]

(g) A student studies the thermal properties of sand and water. He predicts that S should be equal to $6 \times W$.

State whether your results support the prediction. Justify your answer by reference to your readings.

statement ....

justification ....

....

....
[2]

(h) Suggest **two** temperatures that it would be sensible to keep constant when carrying out the experiments.

1. ....

2. ....

[2]

[Total: 11]

4 A student investigates the bending of 1 m length strips of different materials. She compares how far they bend when loaded at one end.

Plan an experiment to investigate how the material from which the strips are made affects the bending of the strips when loaded at one end.

You are **not** required to carry out this experiment.

The following apparatus is available to the student:

strips of wood, plastic, steel and aluminium, all 1 m long
a set of slotted masses
a metre rule
a G-clamp (used to hold the strips to the laboratory bench).

Other apparatus normally available in a school laboratory can also be used.

In your plan, you should:

- draw a diagram to show the arrangement of the apparatus
- explain briefly how you would carry out the investigation, including the measurements you would take
- state the key variables to be kept constant
- draw a suitable table, with column headings, to show how you would display your readings (you are **not** required to enter any readings in the table)
- explain how you would use the results to reach a conclusion.

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[7]

[Total: 7]