Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME		
CENTRE NUMBER		CANDIDATE NUMBER

4322915781

PHYSICS **0625/62**

Paper 6 Alternative to Practical **May/June 2018**

1 hour

Candidates answer on the Question Paper.

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
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.

This syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **11** printed pages and **1** blank page.

DC (SC/CGW) 150895/6

CAMBRIDGE International Examinations

[Turn over

1 A student is determining the density of water. She is provided with a plastic cup, shown in Fig. 1.1.

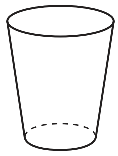

Fig. 1.1

(a) She draws around the base of the cup. Her drawing is shown in Fig. 1.2.

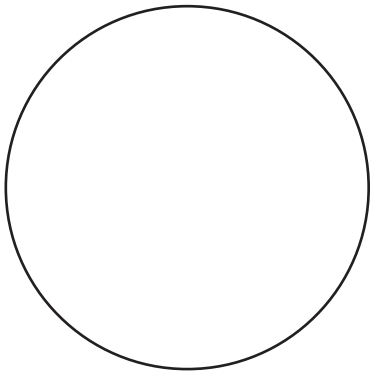

Fig. 1.2

(i) From Fig. 1.2, take and record measurements to determine an accurate value for the diameter D_B of the base of the cup.

D_B = ... cm [2]

(ii) The student places the cup upside down and draws around the rim of the cup.
She determines the diameter D_T of the rim of the cup.

D_T = ...7.2 cm..............................

Calculate the average diameter D of the cup using the equation $D = \frac{D_B + D_T}{2}$.

D = ... cm [1]

(b) **1.** On Fig. 1.3, measure the vertical height *h* of the cup.

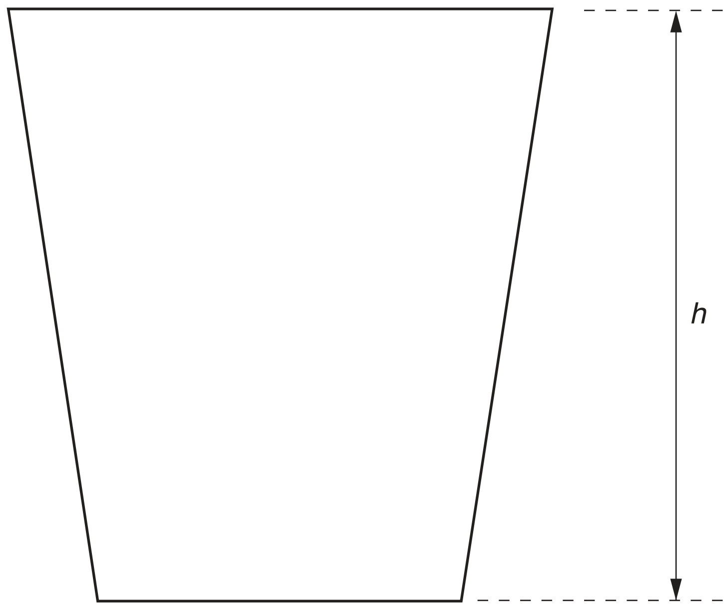

Fig. 1.3

h = ... cm

2. Calculate the volume *V* of the cup using the equation $V = 0.785\,D^2 h$.

V = ... cm^3
[1]

(c) The student fills the cup with water. The mass of the cup with the water is shown in Fig. 1.4.

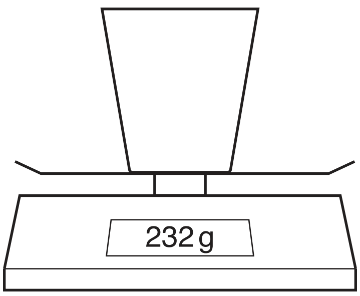

Fig. 1.4

Determine the density ρ of water using the equation $\rho = \frac{m}{V}$ and your value from **(b)2**.

Give your answer to a suitable number of significant figures for this experiment. Include the unit.

ρ = ... [3]

(d) Suggest, with a reason, a part of the procedure **(a)**, **(b)** or **(c)** that could give an unreliable result for the density of water.

part ....

reason ....

.... [1]

(e) The student pours the water from the cup into a measuring cylinder.

Draw a diagram to show water in a measuring cylinder. Show clearly the meniscus and the line of sight the student should use to obtain an accurate value for the volume of the water.

[2]

[Total: 10]

2 A student is investigating the cooling of water.

Fig. 2.1 shows the apparatus used.

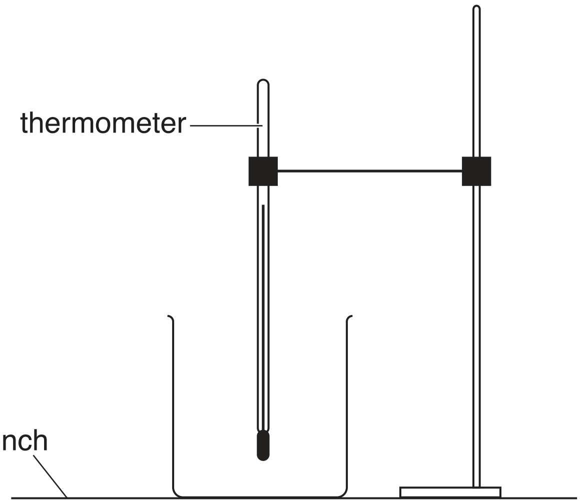

Fig. 2.1

(a) The thermometer in Fig. 2.2 shows room temperature θ_R at the beginning of the experiment. Record θ_R.

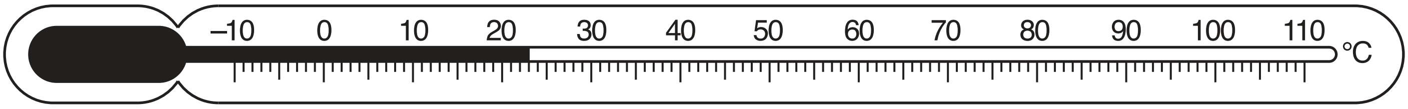

Fig. 2.2

θ_R = ... [1]

(b) The student pours 200 cm^3 of hot water into the beaker.

He records the temperature θ_H of the hot water at time t = 0 and immediately starts a stopclock.

He continues recording the temperature readings every 30 s. The readings are shown in Table 2.1.

(i) Explain why the student should wait a few seconds after placing the thermometer in the hot water before taking the first temperature reading.

....

.... [1]

[Turn over

(ii) Complete the column headings in Table 2.1. [1]

(iii) Complete the time column in Table 2.1. [1]

Table 2.1

t/	θ/
0	70
	60
	52
	49
	46
	43

(iv) Plot a graph of θ/°C (y-axis) against t/s (x-axis). You do **not** need to start the y-axis at the origin (0,0) but the value of room temperature θ_R must be marked on the y-axis.

[4]

(c) Draw a horizontal line across the graph grid to indicate the value of room temperature θ_R, as shown by the thermometer in Fig. 2.2. [1]

(d) State **two** precautions that you would take in order to obtain accurate readings in this experiment.

1. ....

....

2. ....

....
[2]

(e) A student plans to repeat the experiment using the same thermometer and the same volume of water.

Suggest **two** changes to the apparatus or the procedure that would **increase** the rate of cooling of the water.

1. ....

....

2. ....

....
[2]

[Total: 13]

3 A student is determining the focal length of a lens.

Fig. 3.1 shows the apparatus used.

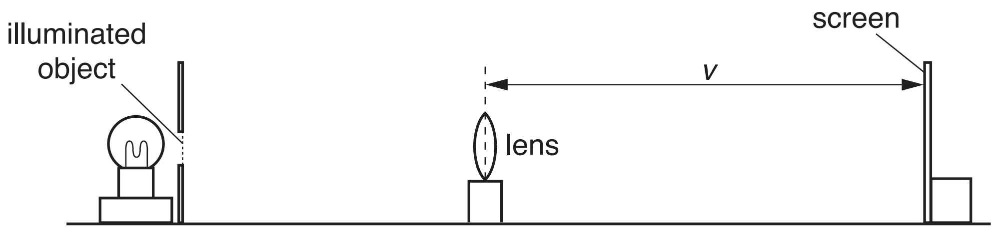

Fig. 3.1

(a) The student adjusts the position of the screen until a clearly focused image is formed on the screen.

(i) On Fig. 3.1, measure the distance v between the centre of the lens and the screen.

v = ... [1]

(ii) Fig. 3.1 is drawn 1/5th actual size.

Calculate V, the actual distance from the lens to the screen

V = ... [1]

(iii) With a clearly focused image formed on the screen, the actual distance from the centre of the lens to the illuminated object, U is 20.0 cm.

Calculate the focal length f_1 of the lens using the equation $f_1 = \frac{UV}{(U+V)}$.

f_1 = ... [2]

(b) The student repeats the procedure in **(a)**, using a different distance U. She obtains another value for the focal length f_2.

f_2 = ...12.2 cm..................

Calculate the average value f_A of the focal length of the lens, using f_2 and your value for f_1 in **(a)(iii)**. Give your answer to a suitable number of significant figures for this experiment.

f_A = ... [2]

(c) The student states that taking more measurements improves the reliability of the value obtained for f_A.

Suggest additional values for *U* that you would use.

....

....

.... [2]

(d) State **two** precautions that you would take in this experiment to obtain accurate readings.

1. ....

....

2. ....

....
[2]

[Total: 10]

4 A student is investigating whether the distance that a toy truck will travel along a horizontal floor, before stopping, depends on its mass.

The following apparatus is available to the student:

a ramp
blocks to support the ramp as shown in Fig. 4.1
toy truck
a selection of masses
other standard apparatus from the physics laboratory.

Plan an experiment to investigate whether the distance that the toy truck will travel along a horizontal floor, before stopping, depends on its mass.

In your plan, you should:

- explain briefly how you would carry out the investigation
- state any apparatus that you would use that is not included in the list above
- state the key variables that you would control
- draw a table, or tables, with column headings to show how you would display your readings (you are **not** required to enter any readings in the table).

You may add to the diagram in Fig. 4.1 to help your description.

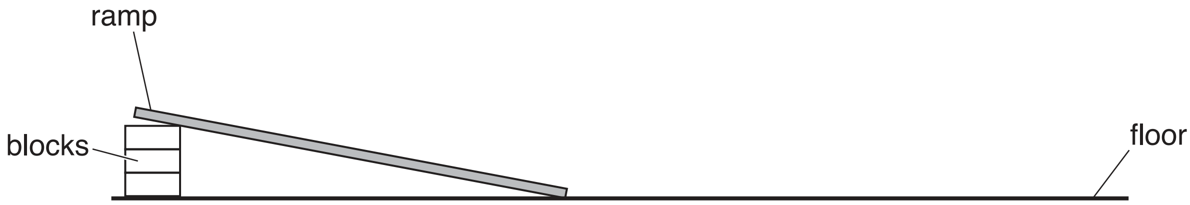

Fig. 4.1

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....[7]

[Total: 7]

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