UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

2092097264

PHYSICS **0625/06**

Paper 6 Alternative to Practical **October/November 2008**

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 work you hand in.
Write in dark blue or black pen.
You may use a soft pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.

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	
5	
Total	

This document consists of **12** printed pages.

SP (SLM/CGW) T73783/6 **R**

UNIVERSITY of CAMBRIDGE International Examinations

[Turn over

1 An IGCSE student is determining the density of the metal from which a load is made.

The apparatus is shown in Fig. 1.1.

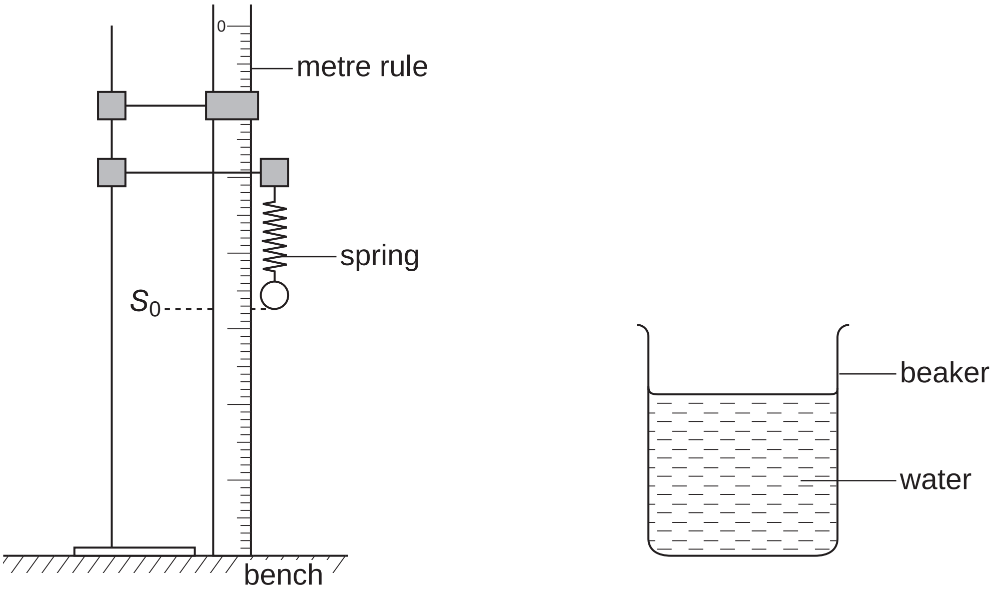


Fig. 1.1

(a) The student records the scale reading S_0 on the metre rule at the bottom of the spring, as shown in Fig. 1.1.

S_0 = 37.4 cm

Describe briefly how the student can avoid a parallax error when taking the scale reading.

....

....[1]

(b) He then hangs the load on the spring as shown in Fig. 1.2. He records the new scale reading S_1.

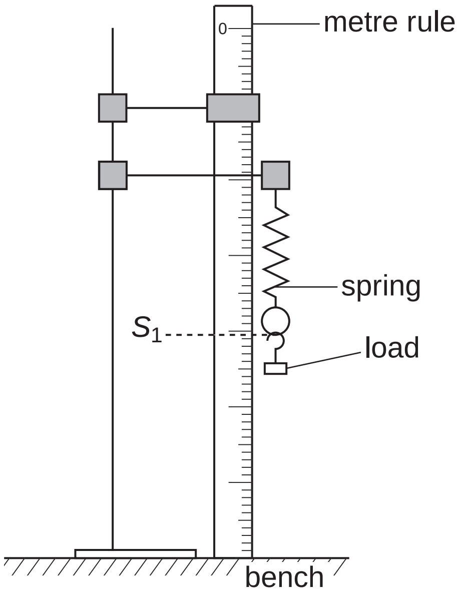


Fig. 1.2

$S_1 = 40.5\,\text{cm}$

(i) Calculate the extension e_1 of the spring using the equation

$$e_1 = (S_1 - S_0).$$

e_1 = ...

The student carefully raises the beaker under the load until it is completely under water. The load does not touch the sides or base of the beaker. He records the new scale reading S_2.

$S_2 = 39.8\,\text{cm}$

(ii) Calculate the extension e_2 of the spring using the equation $e_2 = (S_2 - S_0)$.

e_2 = ...
[2]

(c) Calculate the density ρ of the material of the load using the equation

$$\rho = \frac{e_1}{(e_1 - e_2)} \times k$$

where $k = 1.00\,\text{g/cm}^3$.

ρ = ... [3]

(d) A second load, made from the same material and with the same mass, is too long to be completely submerged in the water.

Suggest whether

(i) the value obtained for e_2 would be greater, smaller or the same as that obtained in part **(b) (ii)**,

....

(ii) the value obtained for ρ would be greater, smaller or the same as that obtained in part **(c)**.

....
[2]

[Total: 8]

2 The IGCSE class is investigating the potential difference across, and the current in, w

The apparatus is shown in Fig. 2.1.

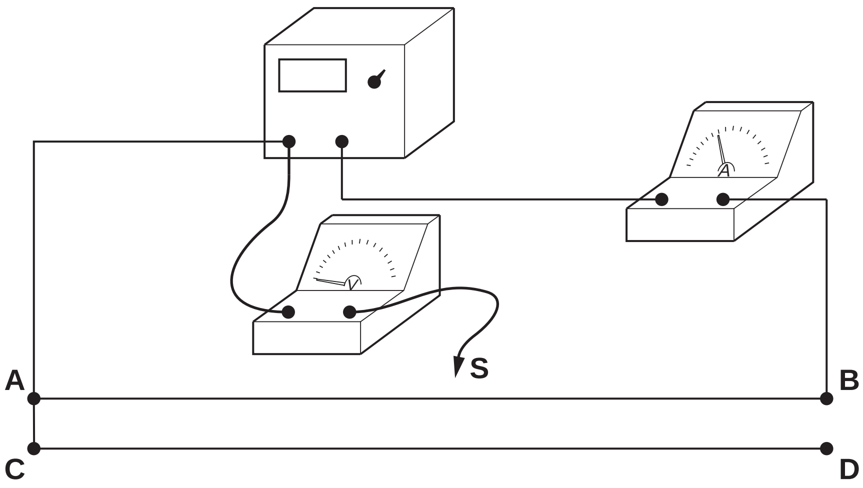


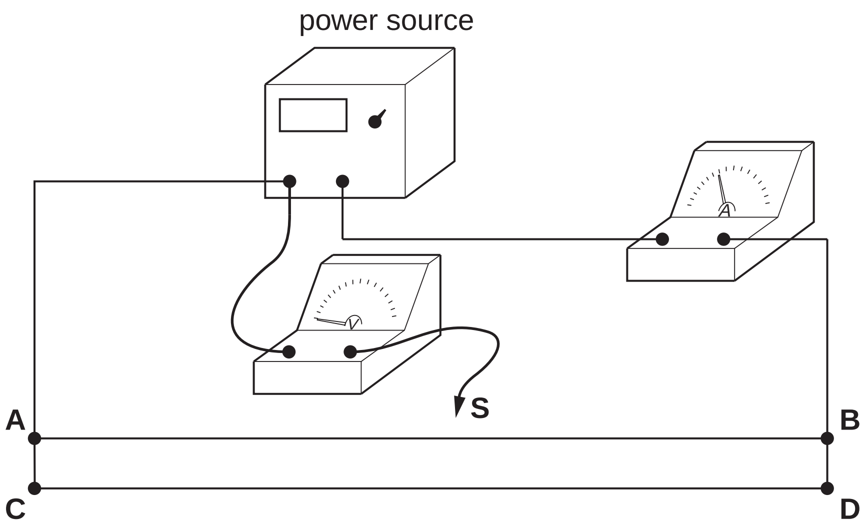
Fig. 2.1

(a) Draw a circuit diagram of the apparatus. Use standard circuit symbols.
(The circuit includes two identical resistance wires **AB** and **CD**. Use the standard symbol for a resistance to represent each of these wires.)
This circuit is called circuit 1.

[3]

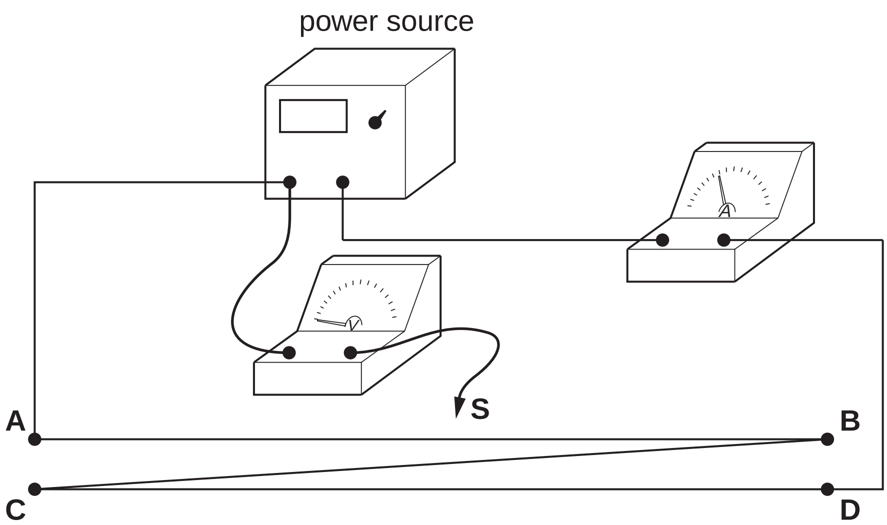
For circuit 1, the student places the contact **S** on the resistance wire **AB** at a dista
0.500 m from **A**. He measures the p.d. *V* across the wire between **A** and **S** and the curr
in the circuit.

The student then records the measurements for circuits 2 and 3, shown in Fig. 2.2 and Fig. 2.3.



circuit 2

Fig. 2.2



circuit 3

Fig. 2.3

The voltage V and current I for all three circuits are shown in Table 2.1.

Table 2.1

Circuit	V /	I /
1	0.83	0.53
2	0.75	0.95
3	0.41	0.28

(b) Complete the column headings in the table. [1]

(c) Theory suggests that,

1. in circuits 1 and 2, the values of potential difference V will be equal,
2. the value of potential difference V in circuit 3 will be half that in circuit 1 or circuit 2.

(i) State whether, within the limits of experimental accuracy, the results support these predictions.

Justify your statement by reference to the results.

Prediction 1 ....

....

Prediction 2 ....

....[2]

(ii) Suggest one reason, other than a change in temperature of the wires, why the results may not support the theory.

....

....[1]

[Total: 7]

3 The IGCSE class is investigating the change in temperature of hot water as cold w… added to the hot water.

A student measures and records the temperature θ of the hot water before adding any of the cold water available.

He then pours 20 cm^3 of the cold water into the beaker containing the hot water. He measures and records the temperature θ of the mixture of hot and cold water.

He repeats this procedure four times until he has added a total of 100 cm^3 of cold water.

The temperature readings are shown in Table 3.1. V is the volume of cold water added.

Table 3.1

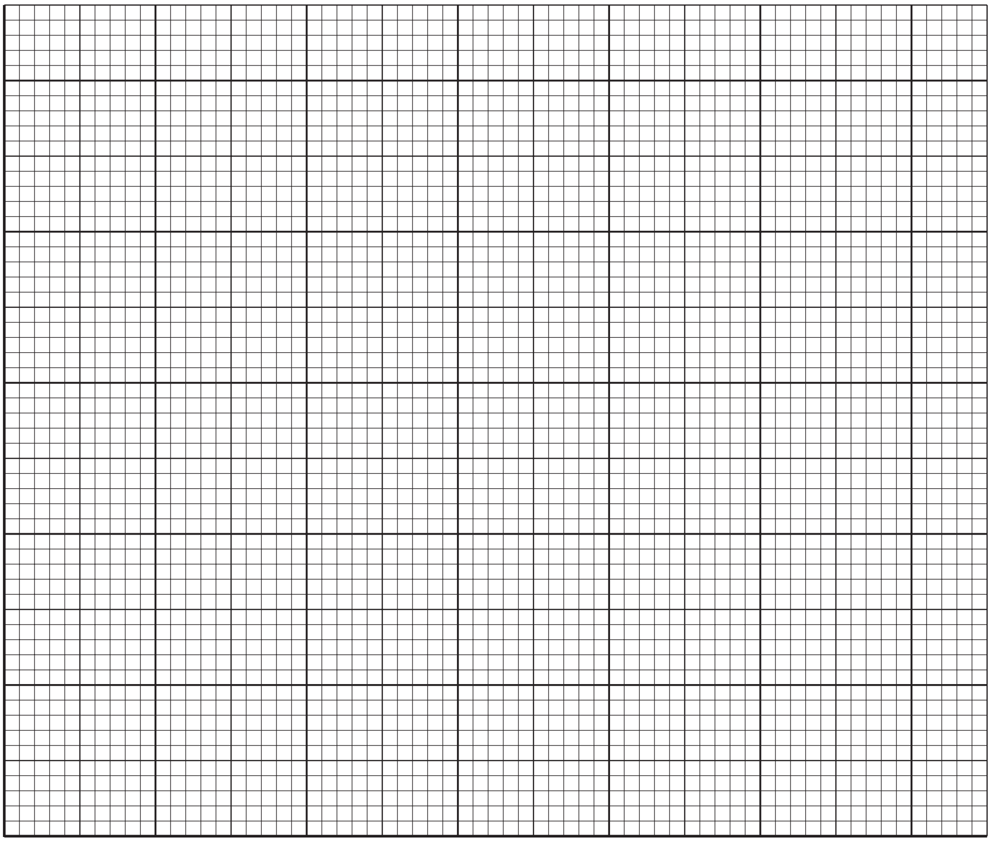
V /	θ /
0	82
	68
	58
	50
	45
	42

(a) (i) Complete the column headings in the table.

(ii) Enter the values for the volume of cold water added.

[2]

(b) Use the data in the table to plot a graph of temperature (*y*-axis) against volume (*x*-axis).
Draw the best-fit curve.



[4]

(c) During this experiment, some heat is lost from the hot water to the surroundings. Also, each time the cold water is added, it is added in quite large volumes and at random times.

Suggest two improvements you could make to the procedure to give a graph that more accurately shows the pattern of temperature change of the hot water, due to addition of cold water alone.

1. ....

....

2. ....

....[2]

[Total: 8]

4 An IGCSE student is determining the focal length of a converging lens.
The apparatus is shown in Fig. 4.1.

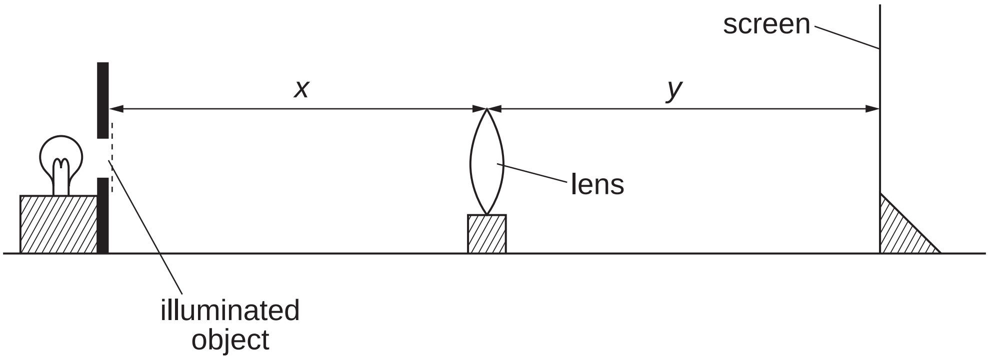


Fig. 4.1

(a) The student places the lens at a distance x = 25.0 cm from the illuminated object. She places the screen close to the lens and then moves it away from the lens until a sharply focused image is formed on the screen. She measures and records the distance y between the lens and the screen.

y = 37.1 cm

Calculate the focal length f of the lens using the equation

$$f = \frac{xy}{(x + y)}.$$

f = ... [2]

(b) She then repeats the procedure with the lens at a distance x = 30.0 cm from the illuminated object.

Fig. 4.1 shows this position of the apparatus. It is a scale diagram.

(i) On Fig. 4.1, measure the distance x_s between the lens and the illuminated object. Also on Fig. 4.1, measure the distance y_s between the lens and the screen.

x_s = ...

y_s = ...

(ii) Calculate the actual distance *y* between the lens and the screen.

y = ...

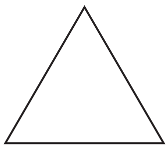
(iii) Calculate the focal length *f* using the new values of *x* and *y*.

f = ...

(iv) Calculate the average value of *f*. Show your working.

average value of *f* = ...
[7]

(c) The illuminated object has the shape shown below.



Draw a diagram to show the appearance of the focused image in **(b)** on the screen.

[1]

[Total: 10]

5 **(a)** Table 5.1 shows some measurements taken by three IGCSE students. The [illegible] column shows the values recorded by the three students. For each quantity, unde[illegible] the value most likely to be correct.

The first one is done for you.

Table 5.1

Quantity measured	**Recorded values**
The mass of a wooden metre rule	0.112 kg 1.12 kg 11.2 kg
The weight of an empty 250 cm^3 glass beaker	0.7 N 7.0 N 70 N
The volume of one sheet of this examination paper	0.6 cm^3 6.0 cm^3 60 cm^3
The time taken for one swing of a simple pendulum of length 0.5 m	0.14 s 1.4 s 14 s
The pressure exerted on the ground by a student standing on one foot	0.4 N/cm^2 4.0 N/cm^2 40 N/cm^2

[4]

(b) **(i)** A student is to find the value of the resistance of a wire by experiment. Potential difference V and current I can be recorded. The resistance is then calculated using the equation $R = V/I$.

The student knows that an increase in temperature will affect the resistance of the wire. Assuming that variations in room temperature will not have a significant effect, suggest two ways by which the student could minimise temperature increases in the wire during the experiment.

1. ....

2. .... [2]

(ii) Name the circuit component that the student could use to control the current.

.... [1]

[Total: 7]