UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

0518132754

PHYSICS **0625/05**

Paper 5 Practical Test **October/November 2008**

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 a 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	
Total	

This document consists of **9** printed pages and **3** blank pages.

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1 In this experiment you will determine the density of the metal from which a load is made.

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Carry out the following instructions referring to Fig. 1.1.

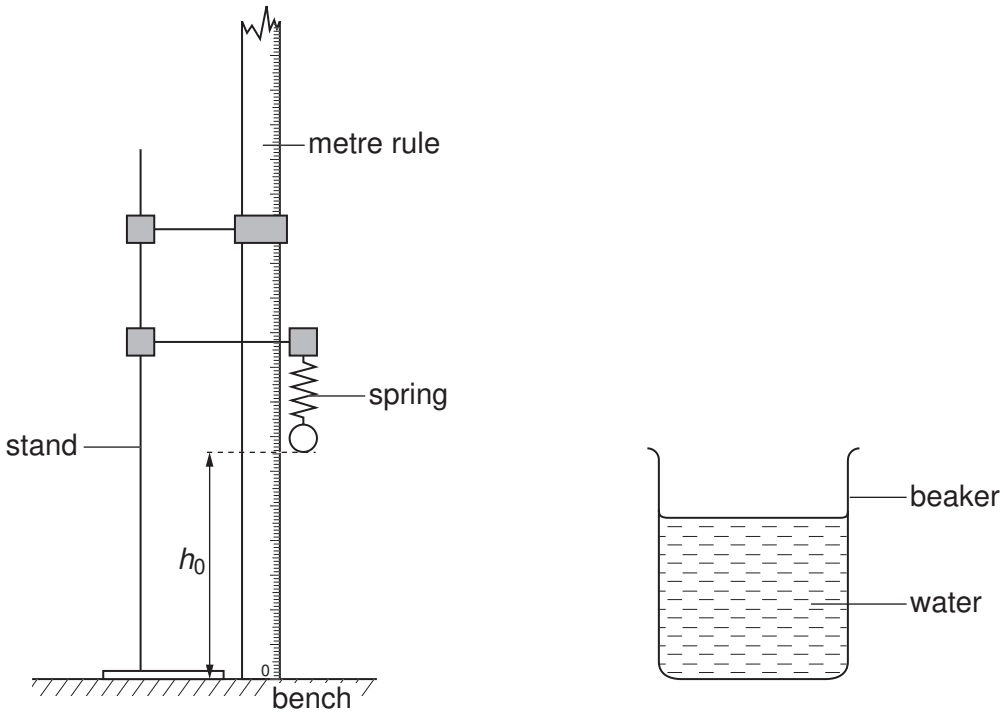

Fig. 1.1

The distance h_0 is the height of the bottom of the spring from the bench.

(a) (i) Record h_0.

h_0 = ...

(ii) Hang the load provided on the spring and record the new height h_1.

h_1 = ...

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

$e_1 = (h_0 - h_1)$.

e_1 = ...[4]

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(b) **(i)** Carefully raise the beaker so that the load is completely under water. The load must not touch the sides or the base of the beaker. Record the new height h_2.

h_2 = ...

(ii) Calculate the extension e_2 of the spring using the equation

$$e_2 = (h_0 - h_2).$$

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 g/cm^3.

ρ = ...[2]

(d) If the load, made from the same material and with the same mass, had been just 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)** above,

.....

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

.....[2]

[Total: 10]

2 In this experiment, you will investigate the potential difference across and the current in wires.

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(a) Draw a circuit diagram of the circuit that has been set up for you. 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 is circuit 1.

[3]

(b) (i) Place the contact **Z** on the resistance wire **AB** at a distance x from **A**, where $x = 0.500$ m. Switch on and, using the voltmeter, measure the p.d. V across the wire between **A** and **Z**. Record the value of V in Table 2.1 on page 5.

(ii) Using the ammeter, measure the current I in the circuit. Record the value of I in Table 2.1.

(iii) Take contact **Z** away from the wire **AB** and switch off.

(iv) Use one of the connecting wires provided to connect **B** to **D**. This is circuit 2. Repeat steps **(i)** to **(iii)**.

(v) Disconnect the ammeter from **B**. Disconnect **A** from **C**. Disconnect **B** from **D**. Connect **B** to **C**. Connect the ammeter to **D**. This is circuit 3.

(vi) Repeat steps **(i)** to **(iii)**.

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Table 2.1

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Circuit	*V*/	*I*/
1		
2		
3		

(vii) Complete the column headings in the table. [4]

(c) Theory suggests that the value of potential difference *V* in circuit 3 will be half that in circuit 1 or circuit 2.

(i) State whether or not, within the limits of experimental accuracy, your results support this theory.

.....

Justify your answer by reference to the results.

.....

.....

(ii) Suggest one reason why the results may not support the theory.

.....

.....[3]

[Total: 10]

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3 In this experiment you are to investigate the change in temperature of hot water as water at room temperature is added.

Carry out the following instructions, referring to Fig. 3.1.

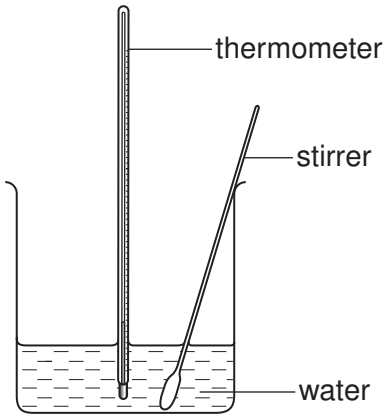

Fig. 3.1

You are provided with 100 cm^3 of hot water (labelled **A**) and a supply of water at room temperature.

(a) Measure and record the temperature θ_r of the water at room temperature.

θ_r = ...[1]

(b) (i) Measure and record in Table 3.1 the temperature θ of the hot water.

(ii) Pour 20 cm^3 of the water at room temperature into the measuring cylinder and then transfer this water to the beaker containing the hot water. Stir, then measure and record in Table 3.1 the temperature θ of the mixture of hot and room temperature water. Record in Table 3.1 the total volume V of room temperature water added.

(iii) Repeat step **(ii)** four times until you have added a total of 100 cm^3 of room temperature water.

(iv) Complete the column headings in the table.

Table 3.1

V/	θ/
0	

[3]

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

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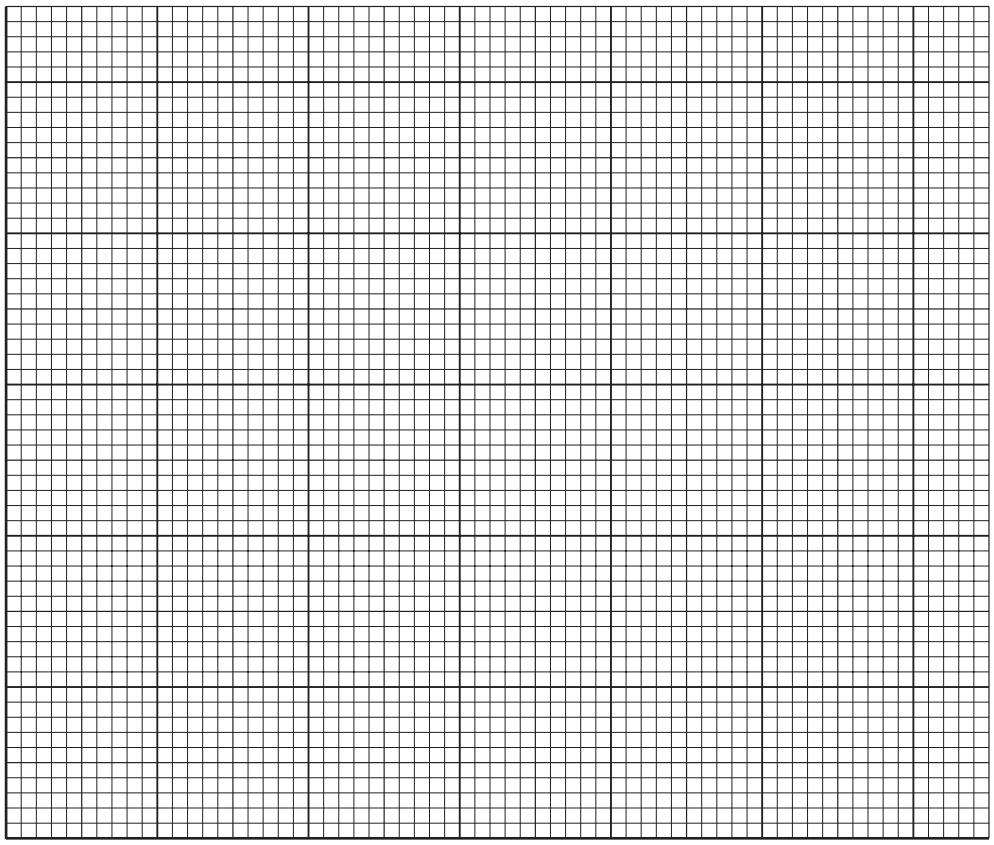

[4]

(d) During this experiment some heat is lost from the hot water to the surroundings. Also the room temperature water is added at random times and in quite large volumes each time. Suggest two improvements you could make to the procedure, that would show more accurately the pattern of temperature change of the hot water, due to addition of room temperature water alone, excluding other factors.

1. .....

.....

2. .....

..... [2]

[Total: 10]

4 In this experiment, you are to determine the focal length of a converging lens. Carry out the following instructions, referring to Fig. 4.1 and Fig. 4.2.

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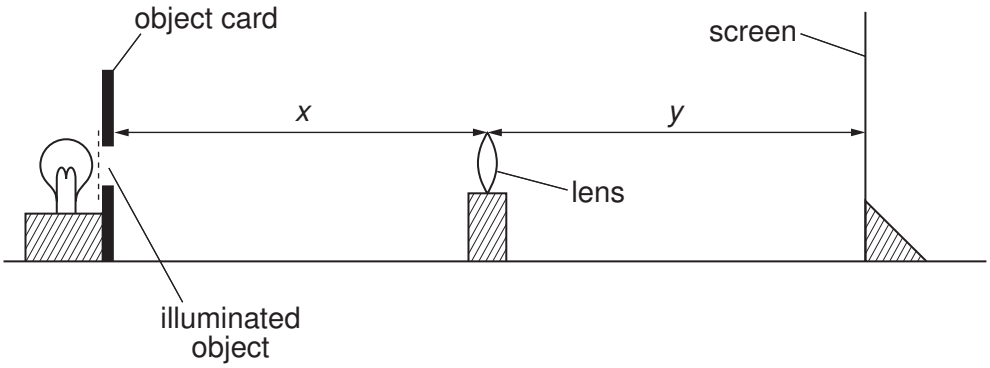

Fig. 4.1

(a) Place the lens at a distance x = 25.0 cm from the illuminated object. Place the screen close to the lens, then move it away from the lens until a sharply focused image is formed on the screen.

Measure and record the distance y between the lens and the screen.

y = ...[1]

(b) Calculate the focal length f using the equation

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

f = ...[2]

(c) Repeat steps **(a)** and **(b)** with the lens at a distance x = 30.0 cm from the illuminated object.

y = ...

f = ...[1]

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

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Average value of *f* = ... [2]

Place the lens at a distance 25.0 cm from the illuminated object and place the mirror as close to the lens as possible as shown in Fig. 4.2.

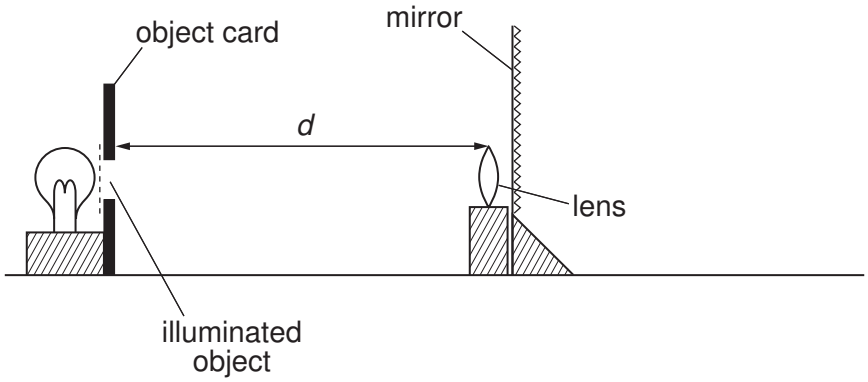

Fig. 4.2

Move the lens and the mirror, keeping the mirror close to the lens, towards the illuminated object until a sharply focused image is formed on the object card next to the illuminated object.

(e) Measure and record the distance *d* between the illuminated object and the lens.

d = ... [1]

(f) Theory suggests that *d* is equal to the focal length *f* of the lens. State whether, within the limits of experimental accuracy, your results support this theory.

.....

..... [1]

(g) Write down one similarity and one difference between the image and the object using the apparatus as set up in part **(e)** when a sharply focused image is formed.

One similarity .....

One difference ..... [2]

[Total: 10]

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