UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER | CANDIDATE NUMBER

9274367695

CO-ORDINATED SCIENCES **0654/05**

Paper 5 Practical Test **May/June 2008**

2 hours

Candidates answer on the Question Paper.
Additional Materials: As listed in Instructions to Supervisors

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 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.
Chemistry practical notes for this paper are printed on page 12

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	
Total	

This document consists of **10** printed pages and **2** blank pages.

IB08 06_0654_05/3RP

UNIVERSITY of CAMBRIDGE International Examinations

1 The upward movement of water through a plant is called the transpiration stream. It provides a continuous supply of water to replace water vapour transpired by the leaves. Specimen **A** is a twig from a tree. It was removed from a tree a few hours ago.

(a) (i) Make a drawing of specimen **A** in the space below. You need to include no more than two leaves in your drawing.

[2]

(ii) What has caused wilting in some parts of specimen **A**?

....

....

.... [2]

(iii) Using a pencil, shade the parts of specimen **A** that have **not** wilted. [1]

(iv) Why has specimen **A** not wilted in the shaded area?

....

....

....

How does this help the survival of the plant?

....

.... [2]

For Examiner's

(b) Specimen **B** is part of a stalk of celery that has been standing in a coloured several hours.

Use a sharp knife or scalpel to make a transverse (cross) section of the stalk.
Place this section flat on the white tile.
Make a drawing of the section in the space below.
Label the places where you can see the dye with the correct name for the tissue.

[2]

(c) **(i)** The rate of transpiration is dependent on several environmental factors, including the temperature. State **one** other factor.

.... [1]

(ii) How would you investigate the transpiration rate in celery stalks at different temperatures?

You may assume that a suitable coloured dye is available.

....

....

....

....

....

.... [4]

(iii) In a growing plant, water flowing up the celery stalk replaces the water lost by transpiration.

Suggest **one** other function the water could have in the celery plant.

....

.... [1]

2 You are going to test whether or not the extension of a spring is directly proportional to the applied force.

(a)

- Hang the spring from the stand.
- Make sure you have left enough room for the spring to stretch at least 30 cm.
- Fix the metre rule in a vertical position beside the spring with the zero mark at the bottom.
- Attach the carrier or a small mass to the spring.
- With a small piece of plasticine, fix the pin **P** to the spring as shown in Fig. 2.1 so that the pin acts as a pointer.

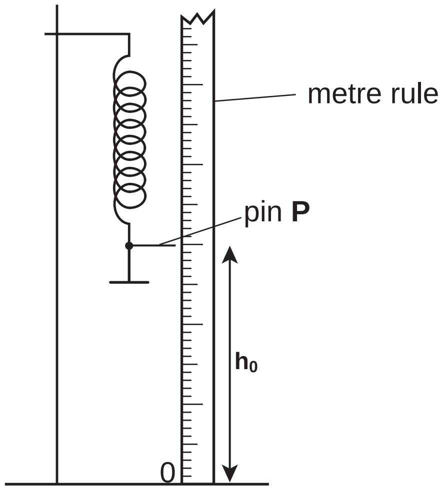

Fig. 2.1

(i) Take the reading on the rule of the height $\mathbf{h_0}$. Record this value in mm in Fig. 2.2.

Add a 50 g mass to the carrier and read the new height, **h**, of the pointer. Record this value in Fig. 2.2.

Repeat by adding further masses to obtain 3 more sets of readings.

Read and record the new value of **h** after each addition.

(ii) Complete the table, Fig. 2.2. You will see that the mass is to be converted into a force. (1kg is 10 N).

Calculate the total increase in length of the spring each time.

total mass added / g	force / N	pointer reading **h** / mm	total increase in length (extension) $\mathbf{h_0}$ - **h**/mm
0	0	$\mathbf{h_0}$ =	0
50	0.5		

[4]

Fig. 2.2

For *...iner's*

(b) Plot a graph of the extension of the spring (vertical axis) against the force.
Draw the best straight line through your points. Before choosing your scale make ... you will be able to answer part **(c)**. [

(c) Use your graph to find the extension that would be produced by a mass of 40 g.

extension = ... mm [2]

(d) Do your results show that the extension is proportional to the force?
Explain your answer.

....

.... [2]

(e) A student said that if much larger masses were used the spring might become over stretched and any relationship already discovered might not apply.
Describe an experiment to test this statement and suggest the likely result. You should include a sketch to show how the shape of the graph would differ.

....

....

....

....

[3]

BLANK PAGE

For
iner's

For Examiner's Use

3 You are provided with three solutions, **A, B** and **C**. The solutions are known to be su[lphuric] acid, sodium carbonate and calcium hydroxide (limewater), but not necessarily in that o[rder]. Carry out the following tests to enable you to identify each of the solutions **A, B** and **C**.

Some of the tests will produce no visible reaction. Simply record 'no reaction' in the appropriate space.

(a) (i) Place about 2 cm^3 of solution **A** into a test-tube. Add a small piece of magnesium and record any observation in Fig. 3.1.

(ii) Repeat using solution **B** and then solution **C**. Record all your observations in Fig. 3.1.

addition of magnesium to each of solutions **A, B** and **C**		
A	**B**	**C**

Fig. 3.1

[2]

(b) (i) Place about 2 cm^3 of solution **A** into a test-tube. Add about 2 cm^3 of copper sulphate solution. Record any observation in Fig. 3.2

(ii) Repeat using solution **B** and then solution **C**. Record all your observations in Fig. 3.2.

addition of copper sulphate solution to each of solutions **A, B** and **C**		
A	**B**	**C**

Fig. 3.2

(2)

(c) You now need to pass carbon dioxide into each solution. Produce the carbon dioxide by adding dilute hydrochloric acid to some solid calcium carbonate, (marble chips) in a test-tube. Immediately after adding the acid to the calcium carbonate, insert the bung and delivery tube. Allow some of the gas produced to be reacted with each of solutions **A, B** and **C**. Use about $5cm^3$ of each solution.

You will need to use a further supply of calcium carbonate and hydrochloric acid to produce the carbon dioxide if the effervescence has ceased before you have tested each solution.

Record your observations in Fig. 3.3.

pass carbon dioxide gas into each of solutions **A, B** and **C**		
A	**B**	**C**

Fig. 3.3

[2]

(d) **(i)** Place about $2\,cm^3$ of solution **A** in a test-tube. Add a small quantity of solution **B**. Record your observation.

observation .... [1]

(ii) Repeat **(i)** using solution **C** instead of **B**.

observation .... [1]

(e) Using the observations above suggest the identity of solutions **A, B** and **C**.

A is ....

because ....

....

B is ....

because ....

....

C is ....

because ....

....

[4]

(f) The concentration of one of the two alkaline solutions is greater than the other. Describe an experiment to enable you to decide which is the more concentrated. You can assume the availability of all three solutions, an indicator, and any apparatus you may require.

....

....

....

....

.... [3]

BLANK PAGE

CHEMISTRY PRACTICAL NOTES

Test for anions

anion	*test*	*test result*
carbonate (CO_3^{2-})	add dilute acid	effervescence, carbon dioxide produced
chloride (Cl^-) [in solution]	acidify with dilute nitric acid, then add aqueous silver nitrate	white ppt.
nitrate (NO_3^-) [in solution]	add aqueous sodium hydroxide then aluminium foil; warm carefully	ammonia produced
sulphate (SO_4^{2-}) [in solution]	acidify then add aqueous barium chloride *or* aqueous barium nitrate	white ppt.

Test for aqueous cations

cation	*effect of aqueous sodium hydroxide*	*effect of aqueous ammonia*
ammonium (NH_4^+)	ammonia produced on warming	-
copper(II) (Cu^{2+})	light blue ppt., insoluble in excess	light blue ppt., soluble in excess giving a dark blue solution
iron(II) (Fe^{2+})	green ppt., insoluble in excess	green ppt., insoluble in excess
iron(III) (Fe^{3+})	red-brown ppt., insoluble in excess	red-brown ppt., insoluble in excess
zinc (Zn^{2+})	white ppt., soluble in excess giving a colourless solution	white ppt., soluble in excess, giving a colourless solution

Test for gases

gas	*test and test results*
ammonia (NH_3)	turns damp litmus paper blue
carbon dioxide (CO_2)	turns limewater milky
chlorine (Cl_2)	bleaches damp litmus paper
hydrogen (H_2)	"pops" with a lighted splint
oxygen (O_2)	relights a glowing splint