Centre Number	Candidate Number	Name

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

PHYSICAL SCIENCE **0652/05**

Paper 5 Practical Test

October/November 2005

1 hour 30 minutes

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 in the spaces provided on the Question Paper.
You may use a soft pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions.
The number of marks is given in brackets [ ] at the end of each question or part question.
Chemistry practical notes for this paper are printed on page 8.

If you have been given a label, look at the details. If any details are incorrect or missing, please fill in your correct details in the space given at the top of this page.

Stick your personal label here, if provided.

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1	
2	
3	
Total	

This document consists of **7** printed pages and **1** blank page.

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UNIVERSITY of CAMBRIDGE International Examinations

[Turn over

1 You are going to investigate whether the mass of a pendulum has any effect on the time of swing. A pendulum consists of a weight on a piece of string that can swing from side to side.

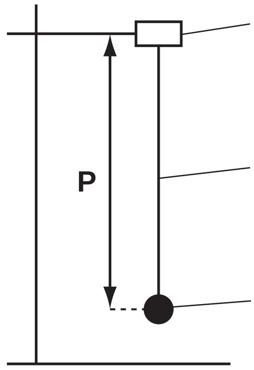

Fig. 1.1

(a) You are going to construct a table of your own to record your results, so you must read through the instructions **(a)** to **(f)** before you do this. You will need to know how many rows are needed for the different pendulum masses and how many columns for the time of swing.

Results table

Fig. 1.2 [5]

(b) Attach the string to the plasticine. Weigh the string and plasticine to the nearest gram and record its mass in your table Fig. 1.2.

Adjust the length of the string to between 450 and 550 mm and set up the apparatus as shown in Fig. 1.1.

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(c) Measure and record the length **P** of the pendulum, in millimetres, from the clamp to the centre of the plasticine.

P = ...mm [1]

You are now going to time to the nearest second, 20 continuous swings of the pendulum. One complete swing is shown in Fig. 1.3.

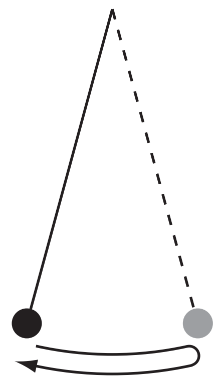

Fig. 1.3

(d) Pull the plasticine about 5 cm to one side and release it. At the same time start the clock and measure the time for 20 complete swings. Record the time to the nearest second in Fig. 1.2.

(e) **(i)** Remove about 10 g of plasticine and weigh the string and plasticine again to the nearest gram. Record this mass in your table Fig. 1.2.

(ii) Set up the pendulum again, making sure that the length **P** is the same as that used in **(c)**. Start the pendulum as in part **(d)** and measure the time for 20 complete swings. Record this time in Fig. 1.2.

(f) **(i)** Repeat **(e)(i)** and **(ii)** until you have 5 sets of readings. Remember to weigh the string and plasticine to the nearest gram and record the time to the nearest second.

(ii) Calculate the time for 1 complete swing for each of the five masses and record the times in Fig. 1.2. [1]

(g) Why is it better to time 20 swings rather than one swing?

.... [1]

(h) Plot a graph of time for 1 swing (vertical axis) against mass of pendulum and draw a suitable line through your points. [4]

(i) What do your results show about the effect of changing the mass of the pendulum on the time of swing? Explain your answer.

....

....

.... [1]

(j) A student suggested that changing the length of the string might affect the time of swing.
Briefly describe how you would carry out an experiment to find out whether or not the suggestion is correct.

....

....

....

....

.... [2]

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2 You are provided with two solids, **A** and **B**, both of which decompose when heated. Carry out the following tests, which include testing for gases.
Chemistry practical notes are provided on page 8.

(a) Place about half the sample of **A** provided into a dry hard glass test-tube and heat until a change is visible. Whilst continuing to heat, test any gas given off with moist red litmus paper and with limewater. Allow the remaining solid to cool and include its colour in the space below.

(i) Describe any visible change in the appearance of solid **A**.

....

.... [1]

(ii) What is the appearance of the residue when cold?

.... [1]

(iii) What change, if any, did you see

in the limewater,

....

to the moist red litmus paper?

.... [2]

(iv) Name any gas given off. State which test enables you to decide.

.... [1]

(v) What can you deduce about the solid **A**?

.... [1]

(b) Carry out a test of your own on the other portion of solid **A** to confirm your answer to **(v)** above. Describe the test and state the result.

....

.... [2]

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(c) Place solid **B** provided into a hard glass test-tube and heat gently at first and then very strongly. Whilst heating strongly, note any visible changes taking place and test any gas given off with a glowing splint and with moist blue litmus paper.

What did you observe when

(i) solid **B** was heated,

....

....

.... [3]

(ii) a glowing splint was used,

.... [1]

(iii) moist blue litmus paper was used?

.... [1]

(d) Solid **B** is known to be a compound of iron. Carry out a test of your own to decide whether **B** is an iron(II) or an iron(III) compound.
Describe the test. State the result and your conclusion.

....

....

.... [2]

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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 result*
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