



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education

CANDIDATE  
NAME

CENTRE  
NUMBER

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**PHYSICAL SCIENCE**

**0652/05**

Paper 5 Practical Test

**October/November 2007**

**1 hour 30 minutes**

Candidates answer on the Question Paper.

Additional Materials: As listed in Confidential Instructions.

**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 8

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	
<b>1</b>	
<b>2</b>	
<b>Total</b>	

This document consists of **6** printed pages and **2** blank pages.



- 1 You are going to find out how the current through a piece of wire varies with its length. The circuit has been set up for you and is shown in Fig. 1.1.

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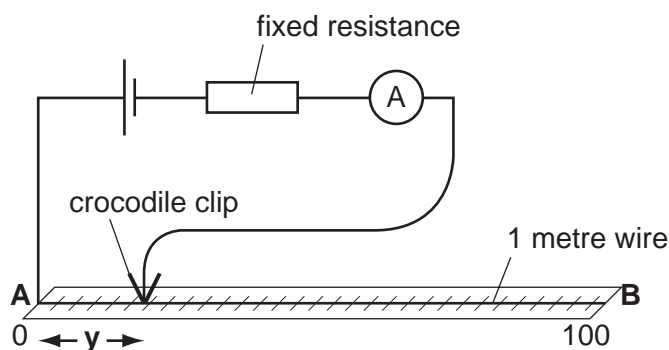


Fig. 1.1

- (a) **S**, the value of the resistance of one metre of the wire **AB**, has been given to you. State this value.

**S** = ..... ohms [1]

- (b) Using the crocodile clip, complete the circuit by touching the wire at the 10.0 cm ( $y = 10$  cm) mark on the ruler. Read the current  $I$  and record this value in Fig. 1.2.
- (c) Repeat this measurement of current for four further values of  $y$  between 20.0 and 90.0 cm. Record your measurements in Fig. 1.2.

length $y$ /cm	resistance <b>R</b> /ohms	current $I$ /amps	current x resistance <b>IR</b> /volts
10.0			

Fig. 1.2

[3]

- (d) (i) Calculate **R** the resistance of the wire for each length of  $y$  using the formula

$$R = \frac{S \times y}{100}$$

**S** is the value recorded above in (a).

Write these values in the appropriate column of the table.

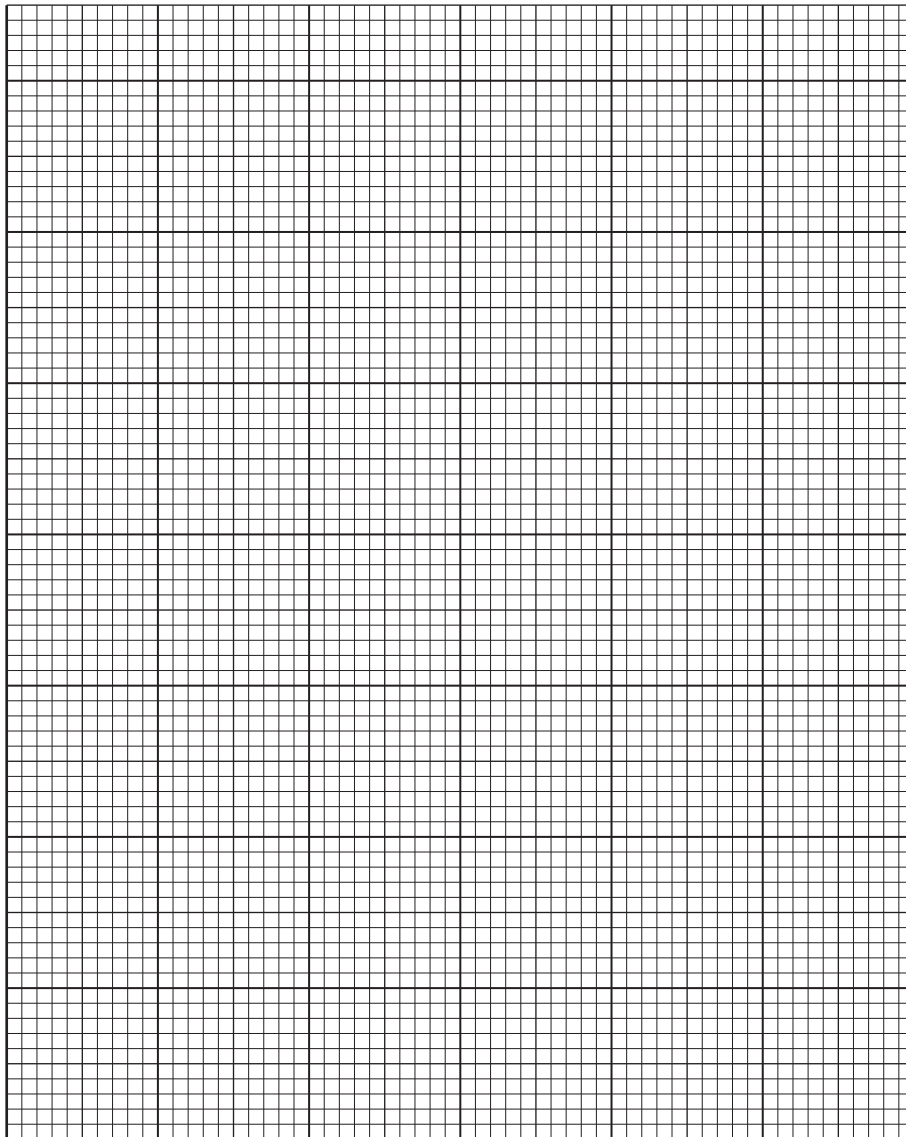
[1]

- (ii) Complete Fig. 1.2 by calculating **IR**, the potential drop, for each value of  $y$ , to three significant figures.

[2]

- (e) Plot a graph of the potential drop,  $IR$ , against length  $y$  (horizontal axis). Both axes should start at zero.  
Draw a smooth curve through your points including the origin.  
Label the curve 'experimental'.

[5]



- (f) Use the graph to find the value of  $y$  when  $IR = 1.00\text{ V}$

$y = \dots\dots\dots\text{cm}$

[1]

- (g) The experiment is repeated using a cell with a larger voltage but the same wire.  
Draw a second curve on your graph to show the expected result.  
Explain how you decided this.  
Label this curve 'expected result'.

.....

.....

[2]

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- 2 **X**, **Y** and **Z** are three colourless solutions. Carry out the following tests which will enable you to suggest a name for each of these solutions.

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Solution **P** is an indicator. It is colourless in acid solution and pink in alkaline solution.

- (a) Place about 1 cm<sup>3</sup> of each solution **X**, **Y** and **Z** in separate test-tubes. Add two drops of solution **P** to each. Record your observations in the table.

solution <b>X</b>	solution <b>Y</b>	solution <b>Z</b>

[1]

State your conclusion about each solution.

solution **X** .....

solution **Y** .....

solution **Z** .....

[2]

- (b) The acid is known to be either hydrochloric acid or sulphuric acid. Carry out the tests for a chloride and a sulphate as described on page 8 to decide the name of the acid. Describe the test and result that enables you to decide. Only one test need be described.

.....  
 .....  
 .....  
 .....

name of acid .....

[3]

- (c) (i) Place about 1 cm<sup>3</sup> of solution **Y** in a test-tube. Add 1 drop of the indicator **P**. Add drops of solution **X** until there is no further change. Record your observations.

observations .....

[1]

- (ii) Repeat (c)(i) using solution **Z** in place of solution **Y**. Record your observations.

observations .....

[2]

- (d) (i) Place about 1 cm<sup>3</sup> of zinc sulphate solution in a test-tube.  
Add solution **Y** a little at a time until there is no further change.  
Record your observations.

observations .....

..... [2]

- (ii) Repeat (d)(i) using solution **Z** in place of solution **Y**.

observations .....

..... [2]

- (e) Suggest a name for

solution **Y** .....

solution **Z** ..... [2]

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## CHEMISTRY PRACTICAL NOTES

## Test for anions

<i>anion</i>	<i>test</i>	<i>test result</i>
carbonate ( $\text{CO}_3^{2-}$ )	add dilute acid	effervescence, carbon dioxide produced
chloride ( $\text{Cl}^-$ ) [in solution]	acidify with dilute nitric acid, then add aqueous silver nitrate	white ppt.
nitrate ( $\text{NO}_3^-$ ) [in solution]	add aqueous sodium hydroxide then aluminium foil; warm carefully	ammonia produced
sulphate ( $\text{SO}_4^{2-}$ ) [in solution]	acidify then add aqueous barium chloride <i>or</i> aqueous barium nitrate	white ppt.

## Test for aqueous cations

<i>cation</i>	<i>effect of aqueous sodium hydroxide</i>	<i>effect of aqueous ammonia</i>
ammonium ( $\text{NH}_4^+$ )	ammonia produced on warming	-
copper(II) ( $\text{Cu}^{2+}$ )	light blue ppt., insoluble in excess	light blue ppt., soluble in excess giving a dark blue solution
iron(II) ( $\text{Fe}^{2+}$ )	green ppt., insoluble in excess	green ppt., insoluble in excess
iron(III) ( $\text{Fe}^{3+}$ )	red-brown ppt., insoluble in excess	red-brown ppt., insoluble in excess
zinc ( $\text{Zn}^{2+}$ )	white ppt., soluble in excess giving a colourless solution	white ppt., soluble in excess, giving a colourless solution

## Test for gases

<i>gas</i>	<i>test and test results</i>
ammonia ( $\text{NH}_3$ )	turns damp litmus paper blue
carbon dioxide ( $\text{CO}_2$ )	turns limewater milky
chlorine ( $\text{Cl}_2$ )	bleaches damp litmus paper
hydrogen ( $\text{H}_2$ )	"pops" with a lighted splint
oxygen ( $\text{O}_2$ )	relights a glowing splint

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