

007044253

Centre Number	Candidate Number
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Candidate Name \_\_\_\_\_

# EXAMINATIONS COUNCIL OF ZAMBIA

## Examination for School Certificate Ordinary Level

### Science

5124/3

### Paper 3 Practical Test

Monday

21 NOVEMBER 2016

#### Additional Materials:

Electronic calculator (non-programmable) and Zec Mathematical Tables

Soft clean eraser

Soft pencil (type B or HB is recommended)

**Time 1 hour 30 minutes**

#### Instructions to Candidates

Write your **name, centre number and candidate number** at the top of this page and on all separate answer paper used.

There are **four questions** in this question paper divided into sections **A and B**.

Answer all questions by writing your answers in the spaces provided in this question paper.

#### Information for candidates

The number of marks is given in brackets [ ] at the end of each question or part question.

Qualitative analysis notes are on page 7.

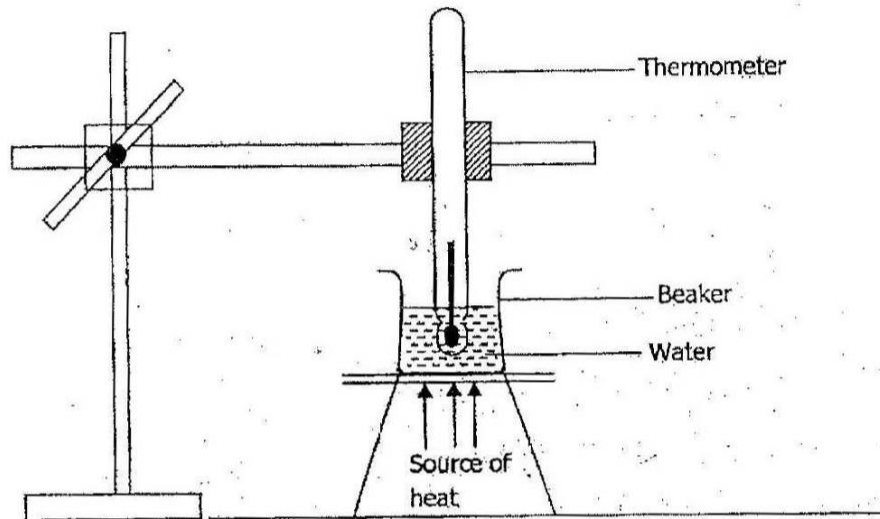
The **Periodic Table** is on page 8.

**Cell phones are not allowed in the Examination room.**

Question	Examiner's Use
Section A	1
	2
Section B	3
	4
<b>Total</b>	

**Answer all questions in this section**

- 1 In this experiment you are required to determine the change in temperature of water during heating and cooling. The experiment has been set-up for you as shown below.



- (a) Record the temperature of water before heating.

..... [1]

- (b) Place the source of heat provided at the bottom of the beaker and record the temperature change every minute for at least five minutes.

Enter the results in the table below.

Time/minutes					
Temp/°C					

[3]

(c) Remove the source of heat from the beaker and record the temperature change every minute for at least five minutes. Construct a table and record the results obtained.

[4]

(d) State the method of heat transfer from water to the thermometer.

..... [1]

(e) State one precaution you took in this experiment.

.....  
..... [1]

[Total: 10 marks]

2 In this experiment, you are required to determine the density of ball bearings. You are provided with six ball bearings and a measuring cylinder containing water and each ball bearing has a mass of 10.0g

(a) State the volume of the water provided in the measuring cylinder.

Volume  $V_1$  = ..... [1]

(b) Place the six ball bearings completely in the volume of water provided. State the new volume of water

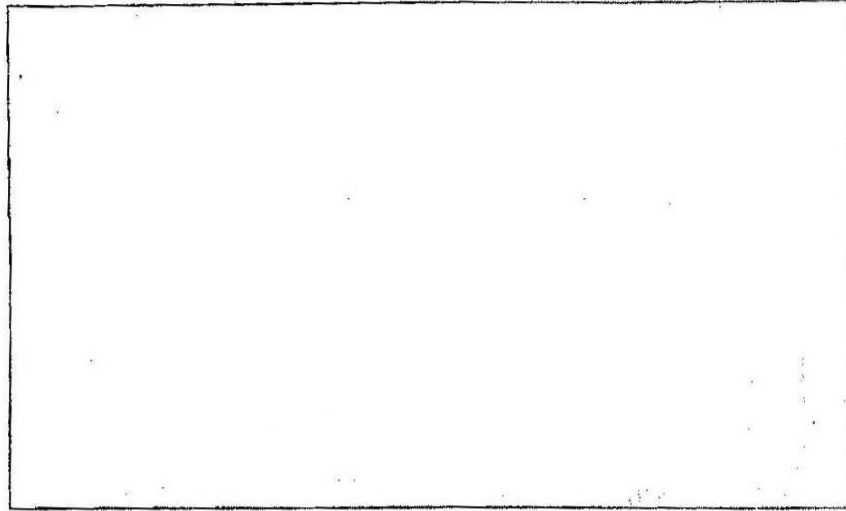
Volume  $V_2$  = ..... [1]

(c) Work out the volume of the six ball bearings. Show your working.

Volume of six ball bearings = ..... [2]

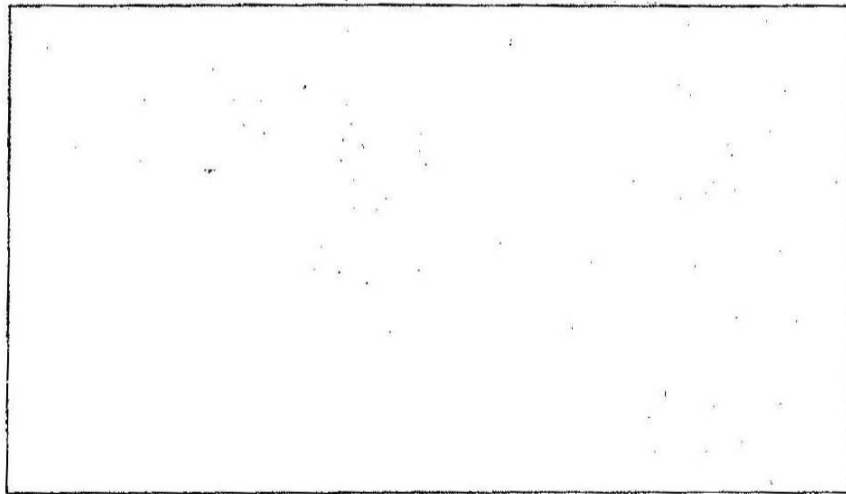
(d) Calculate the density of

(i) six ball bearings (show your working).



[2]

(ii) one ball bearing (show your working).



[2]

(e) Compare the densities of the six ball bearings and one ball bearing.  
Explain your observation.

.....  
.....

[2]

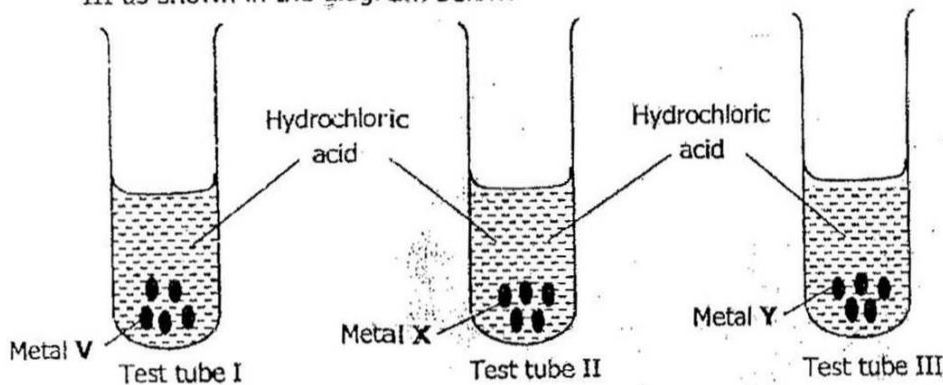
[Total: 10 marks]

Section B (CHEMISTRY) [20 marks]

Answer all questions in this section

- 3 In this experiment you will investigate the reactivity of metals with dilute hydrochloric acid.  
Use about half a spatula-full of each of the metals **V**, **X** and **Y**.

(a) Place metal **V** in test tube I, metal **X** in test tube II and metal **Y** in test tube III as shown in the diagram below.



To each of the three test tubes containing the metals, add about 2cm<sup>3</sup> of hydrochloric acid provided.

Record your observations in the space below:

Test tube I = .....

Test tube II = .....

Test tube III = .....

[3]

(b) Arrange the metals **V**, **X** and **Y** in increasing order of their reactivity.

.....

[2]

(c) Suggest the method of extraction of metal **X**.

.....

[1]

(d) Assuming metal **V** has a valence of 2, write a balanced chemical equation for its reaction with dilute hydrochloric acid using symbol **V**.

.....

[2]

(e) Describe the identity test for the gaseous product in this experiment.

.....

[2]

[Total: 10 marks]

4. In this experiment, you will carry out tests on solution Z to identify the cations and anions present in this compound.

TEST NO.	TEST	OBSERVATIONS
(a) (i)	To about 2cm <sup>3</sup> portion of solution Z in a test tube, add a few drops of aqueous sodium hydroxide.	
(ii)	Add excess aqueous sodium hydroxide to the test tube in (a) (i)	
(b) (i)	To about 2cm <sup>3</sup> fresh portion of solution Z in a test tube, add a few drops of aqueous ammonia.	
(ii)	Add excess aqueous ammonia to the test tube in (b) (i)	
(c)	To about 2cm <sup>3</sup> fresh portion of solution Z, add acidified silver nitrate.	
(d)	To about 2cm <sup>3</sup> fresh portion of solution Z, add acidified Barium nitrate.	

- (e) (i) Name the cation present in solution Z ..... [1]
- (ii) Write the formula of the anion present in Solution Z.  
..... [1]
- (iii) Which test number was used to identify the anion in Z?  
..... [1]
- (iv) Write the chemical formula of compound Z.  
..... [1]

[Total:10 marks]

