**Name:………………………………………………Stream: …………………**

**Signature:……………………………**

**545/2  
CHEMISTRY**

**PAPER 2  
JULY,2022**

**INTERNAL MOCK EXAMINATIONS 2022  
 UGANDA CERTIFICATE OF EDUCATION**

**CHEMISTRY  
 PAPER 2  
 TIME: 2 HOURS**

**INSTRUCTIONS**

* *Section* ***A*** *consists of* ***10*** *structured questions. Answer all questions in this Section.*
* *Answers to these questions must be written in the spaces provided.*
* *Section* ***B*** *consists of* ***4*** *semi- structured questions. Answer any two questions from this Section.*
* *Answers to the questions* ***must*** *be written in the answer booklet(s) provided.*

In both sections all working must be clearly shown.

Where necessary use:  
**[0=16; Fe = 56]**  
1 mole of gas occupies 24l at room temperature.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***For Examiners’ Use only*** | | | | | | | | | | | | | | |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **Total** |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

1 mole of gas occupies 22.4l at s.t.p.

**SECTION A (50 MARKS)**

*Answer* ***all***  *questions in this Section*

1. State what would be observed if the following substances were   
 heated.  
(a) *Zinc*  (1 ½ Marks)

………………………………………………………………………………….

…………………………………………………………………………………..  
(b) *Copper (II) sulphate – 5- water* (1 ½ Marks)

…………………………………………………………………………………..

……………………………………………………………………………………

(c ) *Iodine*  (02 Marks)

…………………………………………………………………………………..

……………………………………………………………………………………

……………………………………………………………………………………

2. Part of the Periodic table is shown below. The letters used are not   
 the symbols of the elements.

|  |
| --- |
| **I**  **VII VIII** |
| **II III IV V VI** |
|  |  |  | **Y** |  |  |  |  |
| **W** |  | **X** |  |  | **Z** |  |  |

(a) Which of the letters represents the

(i) most reactive metal? ( ½ Marks)

…………………………………………………………………………………..

(ii) least reactive non- metal? ( ½ Mark)

…………………………………………………………………………………

(b) Write the formula of the compound that would be formed between:  
(i) **X** and **Z** (01 Mark)

…………………………………………………………………………………….  
(ii) **Y** and **Z** (01 Mark)

……………………………………………………………………………………...  
(c )(i) State whether the compound formed between **Y** and **Z**  will   
 conduct electricity. ( ½ Mark)

………………………………………………………………………………………  
 (ii) Give a reason for your answer in (c )(i). (01 Mark)

3.(a) Hydrogen can be prepared in the laboratory by adding dilute   
 sulphuric acid to Zinc metal in the presence of a catalyst.

(i) Name the catalyst ……………………………………………………………….

(ii) Write equation for the reaction leading to the formation of   
 hydrogen. ( 1 ½ Marks)

……………………………………………………………………………………….

……………………………………………………………………………………….  
(b) State the condition(s) under which hydrogen may be displaced   
 from water by   
(i) Sodium ( ½ Marks)  
 ……………………………………………………………………………………….

(ii) Iron (01 Mark)

……………………………………………………………………………………..  
(c ) Write equation for the reaction in (b)(i). ( 1 ½ Mark)

……………………………………………………………………………………

……………………………………………………………………………………

4.(a) Lead(II) carbonate was heated strongly.  
 (i) State what was observed. (1 ½ Mark)

…………………………………………………………………………………..

……………………………………………………………………………………  
(ii) Write equation for the reaction that took place. ( 1 ½ Marks)

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……………………………………………………………………………………

(b) Dilute nitric acid was added to lead(II) carbonate and to the   
 resultant solution was added dilute ammonia solution drop wise   
 until in excess.

(i) State what was, observed. (01 Mark)

…………………………………………………………………………………..

……………………………………………………………………………………

(ii) Write equation for the reaction that took place. ( 1 ½ Marks)

…………………………………………………………………………………..

……………………………………………………………………………………

5. Rusting is a process in which iron is converted into hydrated   
 iron(III) oxide. State :   
(a) (i) **two**  conditions necessary for rusting to occur. (01 Mark)

…………………………………………………………………………………….

……………………………………………………………………………………

(ii)  **one** method used to prevent iron from rusting. (01 Mark)

…………………………………………………………………………………….

……………………………………………………………………………………..

(b) The data below was obtained when carbon monoxide was passed   
 over a heated sample of an oxide of iron until there was no further   
 change.

Mass of empty dish = 10.98g.  
 Mass of dish + the oxide of iron = 13.30g.  
 Mass of dish + residue = 12.66g.

(i) Determine the formula of the oxide of iron. (03 Marks)  
 **(Fe = 56; O =16)**

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……………………………………………………………………………………..  
(ii) Write equation for the reaction between iron oxide and carbon   
 monoxide. ( 1 ½ Marks)  
 ……………………………………………………………………………………

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6. (a) A moist red litmus paper was held at the mouth of a test tube   
 in which a mixture of ammonium chloride and concentrated   
 sulphuric acid was being heated.

(i) State what happened to the litmus paper. ( ½ Mark)

……………………………………………………………………………………..  
(ii) Write equation for the reaction that took place in the test tube.   
 (1 ½ Marks)

……………………………………………………………………………………..

……………………………………………………………………………………..

(b) A glass rod containing some drops of concentrated hydrochloric   
 acid was held at the mouth of a test tube in which a mixture of ammonium sulphate and sodium hydroxide solution was being heated.

(i) State what was observed. ( ½ Mark)

…………………………………………………………………………………….

(ii) Write equation for the reaction that took place in the test tube.   
 ( 1 ½ Mark)

……………………………………………………………………………………….

……………………………………………………………………………………….

7. Copper(II) sulphate solution was electrolyzed using carbon   
 electrodes.  
(a) State what was observed at the;

(i) Cathode (01 Mark)

……………………………………………………………………………………….  
(ii) Anode (01 Mark)

……………………………………………………………………………………….  
(b) Explain your observation at the cathode. (1 ½ Marks)

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(c ) Write equation(s) for the reaction(s) that took place at the anode.   
 (1 ½ Marks)

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……………………………………………………………………………………….

8. Ethanol can be converted to ethane according to the following   
 equation.  
 **C2H5OH(l)  H2O C2H4(g)**

(a) State the conditions necessary for the reaction to take place.   
 (1 ½ Marks)

……………………………………………………………………………………….

……………………………………………………………………………………….

(b)(i) Name one reagent that can be used to distinguish between ethane   
 and sulphur dioxide. ( ½ Mark)

……………………………………………………………………………………  
 (ii) State what would be observed if each of the gases is separately   
 treated with the reagent you have named in (b)(i). (02 Marks)

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……………………………………………………………………………………….

(iii) Write equation to show any reaction that takes place in (b)(ii).   
 (01 Mark)

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9. The sketch graphs **I,II** and **III** in the diagram below, show   
 variations in concentrations of hydrogen peroxide with time when a   
 standard solution of the hydrogen peroxide was decomposed under   
 different conditions.

Concentration of hydrogen peroxide   
(mold m-3)

**III**

**II**

**I**

Time(S)

1. Identify which one of the sketch graphs, shows decomposition of the hydrogen peroxide.
2. At room temperature without a catalyst. (01 Mark)

…………………………………………………………………………………….