545/2
Chemistry
Paper 2
2hrs

Uganda Certificate of Education
PRE - MOCK EXAMINATIONS 2019
CHEMISTRY
PAPER 2
2hours

Instructions;

- *This paper consists of **two** sections **A** and **B**.*
- *Section **A** is **compulsory**. Attempt only **two** questions in section **B**.*
- *Answers to section **A** must be written in the **spaces provided** only. While those to questions in section B must be written on answer sheets provided.*
- ***Do not** use a pencil.*

For Examiner's use only.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total

SECTION A

All questions are **compulsory**.

1. a) Name two types of flames that a Bunsen burner can produce. (1mark)

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.....

b) State;

i) The conditions(s) under which each of the Bunsen burner flames that you have named in (a) is produced. (1mark)

.....

.....

ii) Which one of the flames that you have named in (a) is more suitable for use? (½ mark)

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.....

c) Give a reason for your answer in (b) (ii). (½ mark)

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.....

d) The gas which is used as a fuel in the Bunsen burner is a hydrocarbon of molecular formula C_4H_{10}.

i) Name the gas (1mark)

.....

.....

ii) State the homologous series to which the hydrocarbon belongs. (1mark)

.....

.....

2. a) Water was added to sodium peroxide;

i) State what was observed. (2marks)

.....

.....

ii) Write equation for the reaction which took place. (1 ½ mark)

.....

.....

b) State;

i) How the gaseous product from the reaction between sodium peroxide and water can be tested. (½ mark)

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.....

.....

ii) two uses of the other product of reaction between sodium peroxide and water. (1mark)

.....

.....

3. a) Name one substance in each case, which is;

i) a carbonate that shows no change in mass when heated. (½ mark)

.....

.....

ii) a compound that when heated turns directly into gas(es) without first melting. (1mark)

.....

.....

iii) a nitrate, which when heated, produces oxygen as only gaseous product. (½ mark)

.....

.....

b) Write equation for the reaction that would take place if each of the following mixtures was heated.

i) Iron and sulphur (1½ marks)

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.....

ii) Zinc and dulite Sulphuric acid (1 ½ marks)

.....

.....

4. a) Magnesium powder was added to copper(II) oxide and the mixture heated
i) State what was observed (2marks)

.....

.....

ii) Write equation for the reaction that took place. (1½ marks)

.....

.....

b) i) If the procedure in (a) was repeated using calcium oxide instead of copper(ii) oxide, state how calcium oxide would be affected. (½ mark)

.....

.....

ii) Give a reason for your answer in (b)(i) (1mark)

.....

.....

5. a) i) Define the term "alloy" (1mark)

.....

.....

ii) Name one common alloy of iron (½ mark)

.....

.....

iii) Give two reasons why the alloy you have name in (ii) is more often used than iron itself. (1mark)

.....

.....

b) Name the major components of the following alloys
i) Solder (1mark)

.....

.....

ii) Duralumin (1mark)

.....

.....

c) State one use of duralumin (½ mark)

……

……

6. The atomic numbers of elements X, Y and Z are 11, 15 and 17 respectively.

a) Write the electronic configuration of;

i) X (1mark)

……

ii) Y (1mark)

……

iii) Z (1mark)

……

b) State the period in the periodic table to which each of the three elements belongs. (1mark)

……

c) Element Z can react with both X and Y to form solid products Q and R respectively;

i) Identify which one of the products would have a lower melting point. (1mark)

……

ii) Give a reason for your answer in (c) (i) (1mark)

……

7. In an experiment to study the reaction of lead(ii) and copper(ii) ions, excess dilute ammonia solution was added to an aquesous solution containing a mixture of copper(ii) and lead (ii) ions and the resultant mixture filtered.

a) State the colour of the;

i) Residue (1mark)

……

ii) Filtrate (1mark)

.....

b) Write;

i) The formula of the cation that was in the filtrate (½ mark)

.....

.....

ii) Equation for the reaction that resulted into formation of the residue.

(1 ½ marks)

.....

.....

c) If the experiment above was repeated using excess dilute sodium hydroxide solution, identify the cation that would appear in the;

i) Residue (1mark)

.....

.....

ii) Filtrate (1mark)

.....

.....

8. a) Potassium hydroxide can react with a solution of Ammonium sulphate to produce ammonia according to the following equation.

$2KOH(aq) + (NH_4)_2SO_4(aq) \longrightarrow K_2SO_4(aq) + 2H_2O(l) + 2NH_3(g)$

calculate the volume of ammonia that would be produced at room temperature if excess potassium hydroxide reacted with 150cm^3 of a 2M Ammonium sulphate solution. (1mole of a gas occupies 24dm^3 at room temperature)

(3½ marks)

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b) i) Name a laboratory reagent that is used to detect ammonia. (½ mark)

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iI) State what would be observed if ammonia was treated with the reagent you have named in (b)(i) (1mark)

……

9. The mass numbers of some particles Q and Z and their numbers of electrons and neutrons are shown in the table below.

Particle	**Mass number**	**Number of electrons**	**Number of neutrons**
Q	14	7	7
R	24	10	12
T	31	15	16
W	36	18	19
X	39	19	20
Y	40	18	22
Z	41	19	22

Identify which one of these is or are;

a) Isotopes (1mark)

……

b) An anion (1mark)

……

c) acation (1mark)

……

d) Atoms of elements in the same group of the periodic table (1mark)

……

e) the atom of an inert gas (1mark)

……

10. a) Name one allotrope of carbon which is;

i) Amorphous (½ mark)

.....

ii) Crystalline (½ mark)

.....

b) State one use of each of the carbon allotropes that you have named in (a) (2marks)

.....

c) Name one element other than carbon which shows allotropy. (1mark)

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SECTION B

*Attempt any **two** questions from this Section*

11. a) Chorine gas readily dissolves in water. Write equation for the reaction that takes place when chlorine is bubbled into water. (1½ marks)

b) a glass tube filled with aqueous solution of chlorine was inverted in a beaker of water and left to stand for some time in bright sunlight.

i) State what as observed. (1mark)

ii) Explain your observation(s) in b(i) (4 ½ marks)

c) Dry chlorine was passed over strongly heated iron wool. State what was observed and write equation for the reaction that took place. (2½ marks)

d) State the condition(s) in each case, and write equation for the reaction between chlorine with;

i) Sulphur (2marks)

ii) Turpentine (2marks)

e) Write an ionic equation for a reaction which can show that chlorine is more reactive than Bromine. (1½ mark)

12. a) i) Distinguish between the terms “Electrode” and “electrolyte” (2marks)
ii) Name the particles by which electric current is conducted in an Electrode and in an electrolyte respectively. (1mark)

b) i) Draw a labeled diagram to show how a solution of copper(II) sulphate can be electrolyzed using graphite electrodes. (2 ½ marks)
ii) Explain how the products at each of the electrodes are formed. (4 ½ marks)

c) Electrolysis of copper(II) sulphate in (b) above was repeated using copper as electrodes instead of graphite.
i) Identify the substance that was formed at anode; and explain briefly why the substance you have identified forms. (2marks)
ii) State two industrial applications of the electrolysis of copper(II) sulphate solution. (1mark)

d) When copper(II) chloride solution as electrolyzed using graphite electrodes; chlorine was produced at the anode.
i) State the condition under which the electrolysis was carried out. (1mark)
ii) Write down an equation leading to the formation of chlorine. (1mark)

13. Ethanol, C_2H_5OH is a common alcohol prepared in our localities here in Uganda.
a) i) Name <u>one</u> substance which is used as a raw material for preparing ethanol in your locality. (1mark)
ii) Describe how a sample of crude ethanol is prepared in your locality; Starting from the substance you have named in a(i). (Diagram or equation not required) (6½ marks)
iii) State how the crude ethanol obtained in a(ii) can be purified. (1mark)

b) Ethanol is commonly used as fuel.
i) Write down an equation for the complete combustion of ethanol, indicating why it’s used as fuel. (2marks)
ii) State the energy change involved when ethanol burns in oxygen. (1mark)

c) i) The enthalpy of combustion of theanol is -1367Jmol^{-}. Calculatethe enthalpy change for the combustion of 5.0g of ethanol. [C=12, H=1, O=16] (2½ marks)
ii) State one use of ethanol other than as fuel. (1mark)

14. a) State what is meant by the term “Rate of reaction.” (1mark)

b) State and explain theeffect of the following factors on the rate of a chemical reaction.

i) Temperature (3marks)

ii) Surface area (3marks)

c) Dilute hydrochloric acid reacts with magnesium to form hydrogen gas. Write an equation leading to the formation of hydrogen gas. (1½ marks)

d) The table below shows the volumes of hydrogen that were collected per minute when a solution of hydrochloric acid was reacted with certain lengths of magnesium ribbon.

Length f Magnesium ribbon /cm	1.0	2.0	3.0	5.0	6.0
Volume of hydrogen (cm^3)	3.8	7.2	10.6	18.2	21.6

i) Plot a graph of volume of hydrogen against length of magnesium ribbon. (4marks)

ii) Explain the shape of your graph. (1½ marks)

iii) Determine the rate of production of hydrogen from 4.0cm magnesium ribbon. (1mark)

END