NAME…… STREAM……

RWENZORI CHRISTIAN VOCATION S.S

E.O.T OF TERM II 2019

S.3 CHEMISTRY PAPER 2

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

- *Section **A** consists of 10 structured questions. Answer all questions in this Section.*
- *Answers to these questions must be written in the spaces provided only.*
- *Section **B** consists of 4 semi-structured questions.*
- *Answer **ONE** questions from this Section.*

Where necessary use;

(H = 1; C = 12; S = 32;Cu = 64; Fe = 56; Pb= 207)

1 mole of gas occupies 24/ at room temperature

1 mole of a gas occupies 22.4/ at s.t.p

SECTION A (50 MARKS)

1. The following table gives information about six substances.

Substance	Melting point /^{0}C	Boiling point /^{0}C	Electrical conductivity as a solid	Electrical conductivity as a liquid
A	839	1484	Good	Good
B	-188	-42	Poor	Poor
C	776	1497	Poor	Good
D	-117	78	Poor	Poor
E	1607	2227	Poor	Poor
F	-5	102	Poor	Good

(a) Which substance could be a metal? (1 mark)

……

(b) State all the substances that are liquids at room temperature . (1 mark)

……

(c) Which substance could have a giant molecular structure similar to that of silicon (IV) Oxide? (1 mark)

……

(d) Which substance could be propane? (1 mark)

……

(e) Which substance could be sodium chloride? (1 mark)

……

2. The table gives the composition of three particles.

Particle	Number of Protons	Number of Electrons	Number of neutrons
A	15	15	16
B	15	18	16
C	15	15	17

(a) What is the evidence in the table for each of the following?

(i) Particle **A** is an atom. (1 mark)

……

(ii) **A**, **B** and **C** are all particles of the same element. (1 mark)

……

(iii) Particles **A** and **C** are isotopes of the same element. (1 mark)

……

(b) i) What is the electronic configuration of particle **A**? (1 mark)

……

(ii) Is element **A**, a metal or a non-metal? Give a reason for your choice. (1 mark)

……

2a)i) Name one substance which can react with ammonium sulphate to produce ammonia in the laboratory. ($\frac{1}{2}$mark)

……

(ii) Write an Ionic equation for the reaction leading to the formation of ammonia from the named substance in a(i) ($1\frac{1}{2}$ marks).

……

(b) Ammonia can react with lead (II) oxide to produce lead according to the following equation.

$3PbO(s) + 2NH_3(g) \longrightarrow 3Pb(s) + N_2(g) + 3H_2O(l)$

State;

(i) the condition(s) under which the reaction takes place . (1 mark)

……..

(ii) the property of ammonia shown in the reaction. ($1\frac{1}{2}$ mark)

……

(c) 3.1g of lead was obtained when ammonia reacted with lead (II) oxide. Calculate the maximum volume of ammonia, measured at s.t.pthat reacted with lead(II)oxide to produce the given mass of lead.

(2 marks)

……

……

……

……

……

3. At room temperature, magnesium ribbon reacts with dilute hydrochloric acid according to the following equation.

$Mg(s) + 2H^+(aq) \longrightarrow Mg^{2+}(aq) + H_2(g)$

(a) State **three** ways by which the formation of hydrogen can be faster. (3 marks)

……

……

……

(b) Sketch a well labeled graph showing the variation of disappearance of magnesium ribbon with time. (1 mark)

……

……

……..

(c) Write equation for the reaction that would take place if dry hydrogen was passed over heated copper (II) oxide. ($1\frac{1}{2}$ mark)

……

……

4(a) Polyethene is synthetic polymer prepared from ethene

(i) Write equation to show how polyetheneis formed ethene. (1 mark)

……

(ii) State one use of Polyethene. ($\frac{1}{2}$mark)

……

(iii) Name the substance that can be used to prepare ethene and state conditions for the reaction. ($1\frac{1}{2}$ mark)

Substance:……

conditions:……

……

(b) Give any one example of:

(i) A natural polymer. ($\frac{1}{2}$mark)

……

(ii) one synthetic polymer ($\frac{1}{2}$ mark)

……

(c) Define the term thermosoftening plastics. (1 mark)

……

5(a) Name a gas:

(i) **X**, which is produced when carbon is burnt in a limited amount of oxygen.($\frac{1}{2}$mark)

……

(ii) **Y**, which produced when steam is passed over heated magnesium. ($\frac{1}{2}$mark)

……

(b) Write equation to illustrate the reaction in (a)(ii). ($1\frac{1}{2}$ mark)

……

(c) State **two** chemical properties, which show similarities between **X** and **Y**. ($1\frac{1}{2}$ mark)

……

……

(d) **Y** reacts with nitrogen in the presence of catalyst to form gas **Z** on large scale. Identify **Z** and the catalyst used. (1 mark)

Z is:……

Catalyst is:……

6. A hydrocarbon **Y** contains 85.7% carbon.

(a) Calculate the simplest formula of **Y** (2 marks)

(b) 0.224g of Y occupied 96cm^3 at room temperature.

(i) Calculate its molecular mass and hence its molecular formula. (2 marks)

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

……..

(iii) Write down one structural formula of **Y**. ($\frac{1}{2}$mark)

……..

7. a) Define hard water. (1mark)

……

……

b) i) State the two types of hardness of water (1mark)

……

……

ii) State the causes of hardness mentioned in b (i). (1mark)

……

ii) State 2 methods of removing hardness of water from river Nyamwamba. (2marks)

……

……

8. A section of the periodic table of elements is shown below. The symbols in the table do not correspond to the actual symbols in the periodic table.

I	II	III	IV	V	VI	VII	VIII
A							B
				C		D	
	E						
	L		F				

a) Write the formulae of ion formed by element (1mark)

i) C……

ii) L……

b) (i) Write the formula of the compound between elements L and D. ($\frac{1}{2}$mark)

……

(ii) Which of the elements has atoms with the largest mass number(s).($\frac{1}{2}$mark)

……

c) Which of the elements forms an oxide which is (1mark)

i) basic

……

ii) acidic

……

d) State two properties of the compound formed between element E and D.(2marks)

……

……

……

9. Carbon dioxide can be prepared in the laboratory from marble clips.

(a) State:- **(2 marks)**

(i) the chemical name of marble clips.

……

(ii) the conditions under which marble clips can react to form carbon dioxide.

……

(b) Write equation for the reaction leading to the formation of carbon dioxide from marble clips. **(1½ marks)**

……

……

(c) Write equation only to show how carbon dioxide react with magnesium. **(1½ marks)**

……

10 (a) Write the formulae of the oxides of: (2marks)

(i)Sulphur:……

.(ii)Aluminium:……..

(b) State the type of bond that exists in the oxide of: (2marks)

(i)Sulphur:……..

(ii)Aluminium:……

(c) State the class to which the oxides of the following elements belong:

(i)Sulphur……(0½mark)

(ii)Aluminium:……..(0½mark)

SECTION B (30 marks)

Answer two questions in this section.

11(a) Copper(II) sulphate solution was electrolyzed between graphite electrodes

(a) State what was observed at the;

i) Anode (1mark)

ii) Cathode (1mark)

(b) Write an equation for the reaction that took place at the anode,(1½)

(c) State the effect of the above electrolysis on;

(i) colour of the solution (1mark)

(ii) pH of the electrolyte. (1mark)

(d) Dilute copper (II) sulphate solution was electrolyzed using copper electrodes. Explain the changes on the size of the electrodes. (4marks)

e) (i) What is the significance of electroplating? (2marks)

(ii) State three conditions necessary for electroplating. (3marks)

(iii) Apart from silver, state three other metals that are commonly used for electroplating. (2marks)

12(a) What is meant by the term water pollution? (1 mark)

(b) Name any **four** substances that cause water pollution and explain how the substances pollute the water. (8 marks)

(c) Suggest any **two** ways a chemist can control water pollution. (2 marks)

(d) State the role of these following substances used during water purification process.
(i) Alum dosing.
(ii) Sand and gravel.
(iii) Chlorine.
(iv) Soda ash (4 marks)

13. a) Describe the structure of graphite (5 marks)
b) State two properties in which graphite differs from diamond (2marks)
c) State what would be observed if burning magnesium ribbon was lowered into a jar of carbon dioxide (2marks)
i) State what was observed (2 marks)
ii) Write equation for the reaction that takes place(1½marks)
iii) Explain the observation in ci) above (2½marks)

END

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