THE UNITED REPUPLIC OF TANZANIA
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT
JOIN THE REVOLUTION PROGRAM
FORM TWO SERIES No. 04
CHEMISTRY

TIME 2:30 HRS **Year 2024**

INSTRUCTIONS

- This paper consists of section **A, B** and **C** with total number of **ten (10**) questions.
- Answer all questions in the space provided
- All writing must be in **black** or **blue** pen except for diagrams which must be in **pencil.**
- Write your **examination number** at the top right corner of every page
- The following atomic masses may be used; H = 1, 0 = 16, S= 32, Cl = 35.5, Na = 23, C = 12, Ag = 108, N =14

SECTION A (15 MARKS)

Answer all questions in this section

1. Items (i) – (x) contains of multiple choice questions, choose the letter of the most correct response and write it against the number in the box provided

i) The most probable valency of an element whose atomic number is 12 is

a) 0 b) 1

c) 2 d) 3

ii) A salt which on exposure to air becomes with a liquid is

a) Efflorescent b) Deliquescent

b) Hydroscopic d) Hydrolytic

iii) A black powder, when heated alone, gave oxygen and a yellow residue. When heated with concentrated hydrochloric acid, chlorine gas was evolved. The black powder was

a) Powder charcoal b) Lead oxide

c) Cupric oxide d) Manganese dioxide

iv) Before using a burette, it should be prepared by washing it with

a) Dilute bench acid, then water
b) Cold water only
c) Hot, then cold water
d) Water, then the solution to be used

v) A hen's egg shell contains calcium

a) Sulphate
b) Carbonate
c) Chloride
d) Nitrate

vi) The most abundant metal in the earth's crust is

a) Iron
b) Aluminium
c) Calcium
d) Sodium

vii) The kinetic theory of gas attempts to explain the behavior of gas on the basis of the

a) Ionization of their molecules
b) Brownian movement
c) Laws of Boyle, Charles, Gay lussac and Avogadro
d) Movement of their molecules

viii) In a class room experiment, air was passed over heated copper turnings in order to obtain some relatively pure nitrogen. Which impurities would you expect to be present in the relatively pure nitrogen gas which was collected over water?

a) Argon, water vapor and helium
b) Helium, carbon dioxide and carbon monoxide
c) Oxygen, hydrogen and rare gases
d) Rare gases, water vapor and carbon dioxide

ix) A sodium atom and a sodium ion have the same

a) Electronic configuration
b) Number of electrons
c) Chemical properties
d) Number of protons

x) An element x is found in period 4 and group II of the periodic Table. If X undergoes the reaction $x \longrightarrow X^{2+}\ 2^{e-}$, the electronic configuration of X^{2+} ions is

a) 2:8:4
b) 2:8:8
c) 2:8:2
c) 2:8:6

2. Match the following items from **list *A*** with corresponding responses from **list *B*** by writing the letter beside the item number in your answer sheet

List A	List B
i. Biomass	A. Carbon monoxide and hydrogen gas
ii. Water gas	B. Carbon monoxide and oxygen
iii. Producer gas	C. Methane
iv. Natural gas	D. Organic matter in living organisms
v. Biogas	E. Energy in matter due to its position or state

SECTION B (70 MARKS)

Answer all questions

3. (a) In form four class the teacher explained on the ''classification of fuels'' but one of the student did not understand. You are now asked to clarify this for him. Use vivid examples in giving your clarification.

(b) Emelda was ordered to the market by his mother to buy charcoal, the mother emphasized her to choose good charcoal. As a form two student who attended the class of fuels and energy. Explain to Emelda four things to consider when choosing a good charcoal.

4. (a) Mr. Msaki was doing experiment concerning flame test of different chemical substances in the chemistry laboratory, unfortunately coat caught fire. Briefly explain which fire extinguishing items you will use to help him to extinguish fire from his laboratory coat

(b) Juma accidentally fallen in the class and was found that he was unconscious. Two students helped him to recover from the condition

i. What process was done by the two students?

ii. What is the name given to two students who helped Juma?

iii. What are the three qualities of the students who gave the help to Juma?

iv. Briefly explain three reasons of giving the process identified in (i) above

5. (a) Experimentation and observation are among important steps during scientific procedures. Briefly explain how each of two can be done

(b) Wakamengo is an expert on the study of composition, structure and properties of matter.

i. Who is Wakamengo?

ii. The knowledge that gained by Wakamengo can assist him in many careers. Name any four careers.

iii. The choice done by Wakamengo is best, briefly explain three reasons that can be used to verify the usefulness of his choice.

6. (a) Briefly explain why

(i) The use of charcoal is harmful to the environment.

(ii) Charcoal is still being used by majority of Tanzania for domestic purpose

b) A mass of 20 20.0g of petrol was burnt in air. The heat produced was used to heat 2.5 litres of water. Given that the heat volume of petrol is 43,640 kj/kg, by how much could the temperature of water be changed? (The specific heat capacity of water $=4.18kj^{1}K^{-1}$, Density of water = 1000 kg/m^3.

7. (a) Why is petrol not recommended to be a fuel in school laboratories? Briefly

(b) Which three heat sources can be used to boil some water in the laboratory instead of Bunsen burner?

(c) Arrange the following steps for lighting the Bunsen burner in a correct sequence using letter A to F

A. Open the air holes to get the required flame.
B. Turn on the gas fully to ensure that plenty of gas is entering the burner
C. Connect the Bunsen burner to the gas main supply
D. Adjust the gas tap until the supply of gas is enough for a time
E. Light the gas at the top of barrel with a lighted matchstick
F. Close the air hole

8. (a) Giving a reason, state whether rust will form or not in each of the following situations (I) – (VI)

I. Iron bar is dipped into boiling water
II. Painted iron bar is dipped into un-boiled water
III. Iron bar dipped in un-boiled water
IV. Oiled iron bar is left outside the room over nights
V. Aluminium wire is dipped in un-boiled water
VI. A dry iron is wrapped with cotton wool

(b) Briefly explain any four methods of preventing rusting

9. (a) Write chemical formula of the two compounds from which oxygen gas can be prepared by decomposition.

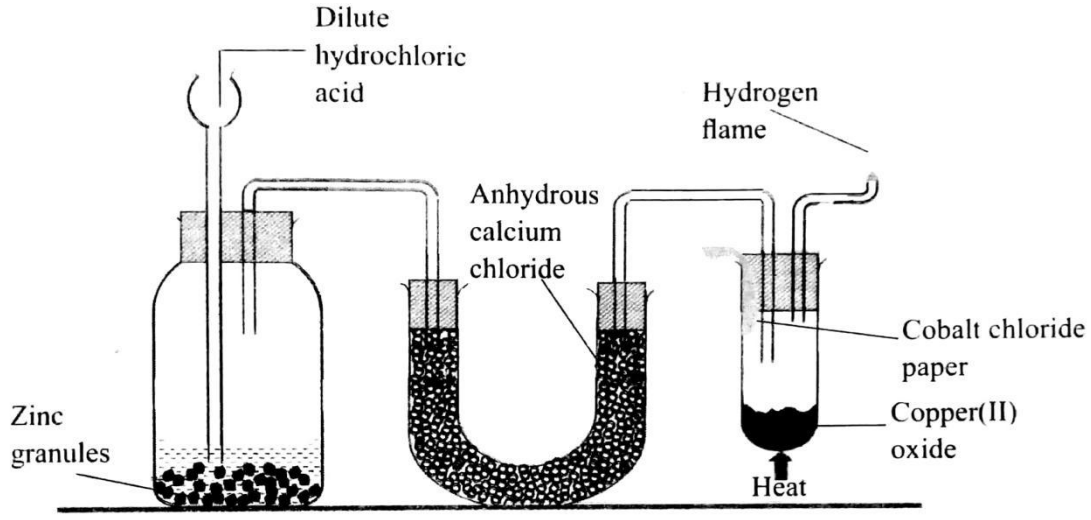
(b) What are three physical properties of oxygen gas?

(c) Why is it important to have abundant oxygen gas on earth? Give five reasons.

SECTION C (15 MARKS)

Answer question **number 10**

10. Kabwaza is a form two student at Mbagala secondary school, He conducted an experiment to investigate the chemical properties of hydrogen gas as shown in the setup below



i) What is the aim of the experiment

ii) What happen to copper (II) oxide during the experiment?

iii) Write well balanced chemical equation between copper(II) oxide and hydrogen gas

iv) What happens to cobalt (II) chloride paper?

v) Why cobalt (II) chloride used?

vi) What other substance can serve the same purpose as cobalt (II)chloride paper?

vii) Which function does calcium chloride perform?