PRESIDENT'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT
SHINYANGA MUNICIPAL COUNCIL
FORM FOUR MUNICIPALITY MOCK EXAMINATION – MAY, 2023
032/1 CHEMISTRY 1

Time: 3:00 Hours ***Tuesday, 23rd May, 2023 A.M***

Instructions

1. This paper consists of section A, B and C with a total of eleven (11) questions.
2. Answer all questions in section A and B, and two (2) questions from section C
3. Cellular phones and any un authorized materials are not allowed in the examination room
4. Write your examination number on every page of your answer booklet(s)
5. The following constants may be used.

Atomic masses: H = 1, C = 12, N = 14, O = 16, Na = 23, S = 32, Ca, = 40, Cl = 35.5, Cu = 64, Zn = 65

Avogadro's Constant = 6.02×10^{23}

G.M.V at S.t.p = $22.4dm^3$

1faraday = 96500Columbs

Standard pressure = 760mm Hg

Standard temperature = 273k

1litre = $1dm^3 = 1000cm^3$

SECTION A (16 Marks)

Answer **all** questions in this section.

1. For each of the items (i) – (x) choose the correct answer from the given alternatives and write its letter in the answer booklet(s) provided.

   i. Aweso wrote four compounds with the same molecular formula but different molecular structures. The occurrence of this compounds in known as;-

      A. Amphoterism
      B. Polymorphism
      C. Isomerism
      D. Allotropy
      E. Isotopy ( )

   ii. A beaker containing solid carbon dioxide is placed in a fume cup board at room temperature. The carbon dioxide becomes gaseous. Which process describes this change of state?

      A. Boiling
      B. Melting
      C. Evaporation
      D. Condensation
      E. Sublimation ( )

   iii. Two Faradays (2F) were required to deposit one mole of metallic element M from an aqueous solution of its salts. If element M has no variable valency, the empirical formula of it phosphate is;-

      A. $M(PO_4)3$
      B. $M_3(PO_4)2$
      C. MPO_4
      D. M_3PO_4
      E. $M_2(PO4)_3$ ( )

   iv. A Bunsen burner produce the hottest flame when;-

      A. The air holes are fully open
      B. The air holes are half open
      C. The air holes are fully closed
      D. The air holes are open at 45° clockwise
      E. The air holes are closed at 45° clockwise ( )

v. Which of the following is not a key word in the definition of Chemistry?

A. Composition of matter
B. Decomposition of matter
C. Behavior of matter
D. Installation of matter
E. Properties of matter ( )

vi. Tumongolele went to the laboratory for measuring specific volume of liquid X. What apparatus would he use to measure that liquid?

A. Burette
B. Volumetric flask
C. Measuring cylinder
D. Graduated beaker
E. Pipette ( )

vii. Which of the following is not a component of the first aid kit?

A. Goggles
B. A pair of scissors
C. Dropper
D. Gloves
E. Razor blade ( )

viii. Which equation shows reduction of an Iron compound?

A. $4Fe + 3O_2 \longrightarrow 2Fe_2O_3$
B. $2Fe + 2HCL \longrightarrow Fecl_2 + H_2$
C. $4Fe + 3O_2 \longrightarrow 2Fe_2 O_3$
D. $Fe_2O_3 + 3CO \longrightarrow 2Fe + 3C0_2$
E. $C + O_2 \longrightarrow CO_2$ ( )

ix. A rapid chemical reaction that release energy in form of light and heat is called

A. Combustion B. Decomposition C. Displacement

D. Neutralization E. Precipitation ( )

x. The molarity of solution containing 26.5g of anhydrous sodium carbonate in 5dm^3 of the solution is ……..M

A. 0.05
B. 0.25
C. 1.25
D. 5.3
E. 0.025 ( )

2. Match the items in **List A** with the response in **List B** by writing the letter of the correct response beside that item number in the answer book let provided.

LIST A	**LIST B**
i. Turning lime water milky	A. Hydrogen gas
ii. Has pungent smell, bleaching property, turning moist blue litmus paper red	B. Hydrogen chloride gas C. Sulphur dioxide gas D. Oxygen gas E. Chlorine gas
iii. Re – light a glowing splint	F. Carbon dioxide gas
iv. Form a dense fume with gaseous ammonia	G. Ammonia gas H. Sodium carbonate
v. Turn the filter soaked in acidified potassium dichromate (vi) from orange to green	I. Sodium chloride.
vi. Burns with pop – sound	

SECTION B (54 Marks)

Answer **all** questions in this section

3. a) Aisha draw a periodic table and then put a shadow on the element with atomic number 8. What type of chemical bond is found between the atoms of that element?

b) Compound X contains 24.24% carbon, 4.04% hydrogen and 71.72% chlorine. Given that, the vapour density of X is 49.5

i. Calculate the molecular formula of the compound X
ii. Draw and name the open structure formula of the possible isomers from the molecular formula determined.

4. a) A form two student at Mtakuja secondary school went to his school chemistry laboratory and found two chemical reagents on the table which are hydrogen peroxide and Manganese IV oxide.

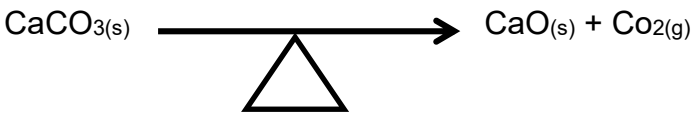
i. Suggest the suitable experiment that he can perform by using those reagents.
ii. Outline six apparatuses that he could use in conducting that experiment.

b) (i) write down a balanced chemical equation showing the reaction taking place in 7(i) above

(ii) State two uses of the gas obtained in that experiment.

5. a) During the experiment of electrolysis, students observed that sold NaCl does not conduct electricity while its aqueous solution does. Explain to them why this happened.

   b) The thermal decomposition of Calcium carbonate can be represented by the following equations.



   Calculate the volume of carbon dioxide (measured) at S.T.P) liberated when 150g of calcium carbonate are completely burnt.

6. You are given the following items;-

   Charcoal, a pencil ink and materials used for cutting glasses

   a) (i) Allocate items above into specific allotropic forms of carbon

   (ii) Name the process for making charcoal

   b) Which item of the three above conducts electricity? Give reasons.

7. a) Write Ironic equation for the following.
   i. Laboratory preparation of ammonia gas
   ii. Preparation of barium sulphate from barium chloride and sodium sulphate
   iii. Neutralization of a strong acid and strong alkal.

   b) Consider the following elements of group seven in order of which they appear in their group in the periodic table.

   F, cl, Br and I
   i. Which element is more electronegativity?
   ii. Name the least electronegative element
   iii. Which element has the largest atom?
   iv. Write the electronic configuration of the chlorine atom.

8. Give the meaning of the following terms

i. Cracking
ii. Isomerism
iii. Hydrocarbon

SECTION C (30 Marks)

Answer only **two (02)** questions from this section.

9. Mr. Mkoga prefers to add in organic fertilizers in his farm. Mr. Mfinanga told him it is better to add organic manure instead of inorganic fertilizer. Explain six (6) reasons that led Mr. Mfinanga to advice Mr. Mkopa to add organic manure in his farm.
10. With specific examples of oxides of non – metals, discuss the four general effects caused by those oxides.
11. Most of areas in Dar es Salaam have a problem of water hardness which affect much their daily life activities. As an expert, explain how you can help them to solve the problem. (Give 5 points)