THE PRESIDENT'S OFFICE

REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT
MORNING STAR SECONDARY SCHOOL
TERMINAL EXAMINATION – MAY 2024
CHEMISTRY – FORM THREE

NAME_____ Stream_____

Time 2:30 hours   **Year 2024**

INSTRUCTIONS

1. This paper consists of section A, B and C with total of fourteen (14) questions
2. Answer **all** questions in section A & B and **one (1)** question from section C
3. Cellular phones and any unauthorized materials are not allowed in the examination room
4. Write your Examination number on every page of your answer booklet
5. The following constants may be used;
   - Atomic masses: H = 1, O = 16, N = 14, Pb = 207, S = 32, Zn = 65, Cl = 35.5, Cu = 64, Fe = 56 and K = 39
   - Avogadro's number = 6.02×10^{23}
   - GMV at s.t.p = $22.4 dm^3$
   - 1faraday = 96500 coulombs
   - Standard pressure = 760mmHg
   - Standard temperature = 273k
   - 1litre = $1 dm^3$ = $1000 cm^3$

SECTION A: (15MARKS)

1. For each of the items (i)-(x), choose the correct answer among the given alternatives and write its letter beside the item number in the answer sheet provided;

    i. During chemical reaction when the energy required to break bonds is lower than the energy released during bond formation. That reaction will be termed as;
       A.   Synthesis   D. Exothermic
       B.   Endothermic   E. Explosion
       C.   Double decomposition

    ii. The empirical formula differs from molecular formula in a way that;
       A. Molecular formula may have higher mass
       B. Empirical formula may have higher mass
       C. Always the empirical formula has lower mass

       D. Always the molecular formula has higher mass

E. Empirical formula shows the simple ratio by mass while molecular shows actual number of atoms

iii. A form four students at Mtakuja secondary school was doing investigation on COVID 19 pandemic, but unfortunately he found the results obtained do not support his hypothesis. What advice would you give him?

    A. To leave out the experiment results that do not support hypothesis

    B. To change his experiment

    C. To identify a new problem

    D. To give ideas for further testing to find a solution

    E. To draw a conclusion

iv. 24cm3 of solution of 01.M KOH were exactly neutralized by $30cm^3$ of sulphuric acid solution. What will be the concentration of sulphuric acid in g/dm^3?

    A. $0.04g/dm^3$ D. $402g/dm^3$

    B. $3.92g/dm^3$ E. $0.392g/dm^3$

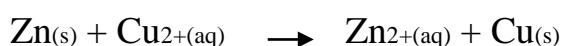   C. $0.00392g/dm^3$

v. When a metallic element burns in air the compound formed is likely to be;

    A.   Basic oxide   D. Acidic oxide

    B.   Common oxide   E. A gas

    C.   A salt

vi. Which type of reaction is represented by the following chemical equation?

$$Zn_{(s)} + Cu^{2+}_{(aq)} \longrightarrow Zn^{2+}_{(aq)} + Cu_{(s)}$$

    A. Displacement   C. Neutralization

    B. Decomposition   D. Synthesis

vii. A solution of pH 1.6 is best described as;

    A.   Strong acid   D. Neutral solution

    B.   Strong base   E. Weak acid

    C.   Weak base

viii) The volume occupied by 8.6g of carbon dioxide at S.T.P is;

    A. $44.8dm^3$ D. $10.2dm^3$

    B. $22.4dm^3$ E. $4.4dm^3$

    C. $48.4dm^3$

ix) If 0.5g of hydrogen gas are exploded in air, the mass of water formed is;

    A. 0.25g   D. 4.5g

    B. 0.75g   E. 9.0g

    C. 4.00g

x) What is the oxidation number of the phosphorous atom in the H_3PO_4;

A. +5   D. -2

B. 0   E. -5

C. +2

2. Match item in **list A** with a correct in **list B** by writing the letter of correct responses besides the item number.

LIST A	LIST B
i. A solvent which dissolves most substances to form solution	A. Solid
	B. Solution
ii. A substance that has no definite shape and size	C. Water
iii. A substance that has a fixed volume and does flow easily	D. Sugar
iv. A substance whose component can be separated by physical means	E. Milk
	F. Gas
v. Homologous mixture of two or more substances.	G. Liquid
vi. A substance that has definite shape and size	H. Air

SECTION B: 54 MARKS Answer all questions in this section

3. (a) Define the term class B fire

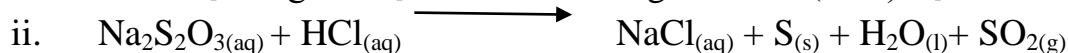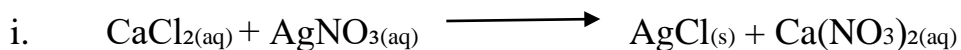(b) i. mention two combustible materials in class B fire

ii.Why is water not used to put off oil fire?

c.   Your friend close has caught fire in order to extinguish the fire you have decided to cover her with a damp blanket. What is the function of the damp blanket?
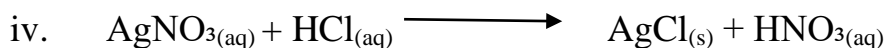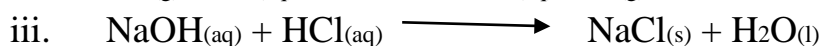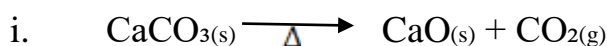
4. a)   Define the term empirical formula

b) An oxide of iron, 4.50 gm by mass, was completely reduced by heating it in a certain reducing agent 3.15gm was produced calculate the empirical formula of the compound

5. a)   Balance the following reaction and write net ionic equation

i. $CaCl_{2(aq)} + AgNO_{3(aq)} \longrightarrow AgCl_{(s)} + Ca(NO_3)_{2(aq)}$

ii. $Na_2S_2O_{3(aq)} + HCl_{(aq)} \longrightarrow NaCl_{(aq)} + S_{(s)} + H_2O_{(l)} + SO_{2(g)}$

b) State the types of reaction in the following compound

i. $CaCO_{3(s)} \xrightarrow{\Delta} CaO_{(s)} + CO_{2(g)}$

ii. $Cl_{2(g)} + KI_{(aq)} \longrightarrow KCl_{(aq)} + I_{2(g)}$

iii. $NaOH_{(aq)} + HCl_{(aq)} \longrightarrow NaCl_{(s)} + H_2O_{(l)}$

iv. $AgNO_{3(aq)} + HCl_{(aq)} \longrightarrow AgCl_{(s)} + HNO_{3(aq)}$

6. a) with the help of one example, give the meaning of the following:

i. An electrolyte
ii. A non-electrolyte

b) The decomposition of an electrolyte by an electric current is called electrolysis. Name the ions that move to the:
   i. Negative electrode(cathode) during electrolysis
   ii. Positive electrode(anode) during electrolysis

c) A solution of 1M copper (II) chloride was electrolyzed using graphite electrodes. Write the reaction which took place at the:
   i. Anode
   ii. cathode

7. Ashura during the practical activities she feels heartburn, her friend she advised her to use ashes as local medicine to control heartburn condition. You as young chemist state.
   i. Which characteristics that makes ashes used as local medicine to treat heartburn?
   ii. List any three-compound found in the laboratory with similar characteristics as ashes
   iii. Analyse any three physical properties of compound with similar characteristics of ashes

8. during a neutralization reaction, a student placed 25cm3 of sodium hydroxide in a flask and added few drops of phenolphthalein. The base required 22cm3 of dilute hydrochloric acid for complete neutralization.
   a) What apparatus should have been used to measure the exact volume of sodium hydroxide solution?
   b) What was the colour of the solution at the end of the neutralization reaction
   c) What reagent was more concentrated than the other? Explain
   d) Name the salt that was formed
   e) How would you obtain pure crystals of the salt resulting from the solution?

SECTION C: 30 MARKS

Answer **two (2)** questions from this section

9. a)   Explain the application of changes of state matter (4 points)
b) 25cm³ of 0.1MHCl was enough to dissolve completely 3.35g of hydrated sodium carbonate ($Na_2CO_3.XH_2O$) which is dissolved in 250mls of distilled water where by only 25cm³ need for reaction. Determine number of water crystallization in hydrated sodium carbonate

10. Lead nitrate decomposes on heating as indicated in the equation.

$2Pb(NO3)2(s) \longrightarrow 2PbO(s) + NO_2 (g) + O_2 (g)$

If a volume of 112cm3 of oxygen gas was collected at STP when a sample of lead nitrate was completely decomposed by heating, calculate the:

   a) Mass of the lead nitrate sample
   b) Mass of lead ii oxide produced.
   c) Volume of nitrogen dioxide gas produced at STP.

11.   Form three students were arguing on the reaction of acid and base some said the reaction between acids and bases are very important some not. If you were among in the argument explain five (5) importance of the reaction between acid and base.