THE UNITED REPUBLIC OF TANZANIA

PRESIDENT'S OFFICE

REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT

PWANI REGION

NYUMBU SECONDARY SCHOOL

FORM THREE TERMINAL EXAMINATION

032 CHEMISTRY

TIME: 3 hours **May, 2024**

Instructions

1. This paper consists of sections **A, B,** and **C** with a total of **eleven (11**) questions
2. Answer all questions in section **A** and **B** and only **TWO** questions 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 (s).
5. The following constants may be used
   Atomic masses: $H = 1, Ca = 40,\ Zn = 65,\ Cl = 35.5\ Na = 23, C = 12, Pb = 207$
   Avogadro's number $= 6.02 \times 10^{23}$
   GMV at S.T.P $= 22.4\ dm^3$
   I Faraday $= 96500 coulombs$
   $1\ litre = 1\ dm^3 = 1000 cm^3$

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 beside the corresponding item number in the booklet provided

   (i) Which of the following are the components needed to start fire
   - A. Matchbox, firewood and oxygen
   - B. Match box , firewood and kerosene
   - C. Oxygen, fuel and firewood
   - D. Oxygen heat and firewood
   - E. Hydrogen, chlorine and water

   (ii) What is the IUPAC name for H_2SO_4?
   - A. Sulphuric (VI) acid
   - B. Sulphuric (IV) acid
   - C. Hydrogen sulphate
   - D. Sulphuri (VII) acid
   - E. Hydrogen tetra sulphate

   (iii) Glucose dissolves in water to form a uniform mixture
   - A. Water is solution glucose is solvent and product is solute
   - B. Water is solute, glucose is solvent and product is solute
   - C. Water is solvent, glucose is solute and product is solution
   - D. Water and glucose forms immiscible mixture
   - E. Water and glucose form emulsion

   (iv) The reason why white anhydrous copper(II) sulphate turns blue exposed in atmosphere is that it
   - A. Absorbs water vapour
   - B. Reacts with oxygen
   - C. Reacts with carbon dioxide
   - D. Become dry
   - E. Release water to the atmosphere

   (v) Form Three students in a certain school were doing a scientific procedure about malaria disease in the Ruvuma region. Which of the following scientific procedure was used to accept or reject the hypotheses
   - A. Conclusion
   - B. Data interpretation
   - C. Experimentation
   - D. Hypothesis formulation
   - E. Problem identification

(vi) Three elements T,Q and R are in the same period of the periodic table. The oxide of T is amphoteric, the oxide of Q is basic and the oxide of R is acidic. Which of the following shows the elements arranged in order of increasing atomic number?

A. T, Q, R
B. Q,T, R
C. Q, R, T
D. R, T, Q
E. T, R, Q

(vii) Mr. Makambo wanted to transfer some chemicals from the Winchester bottle to small bottles for his students to do an experiment. The small bottles are called

A. Reagent bottles
B. Storing bottles
C. Wash bottles
D. Chemical bottles
E. Drop bottles

(viii) The solution with pH value of 5 is said to be

A. A strong base B. A Neutral C. A weak acid D. A strong acid E. A weak base

(ix) During chemical reactions where the energy required to break bond is lower than the energy released during bond formation, the reaction will be termed as

A. Synthesis reaction
B. Exothermic reaction
C. Endothermic reaction
D. Explosion reaction
E. Double decomposition

(x) Which action should be taken immediately after concentrated Sulphuric acid is spilled on the skin?

A. It should be rinsed off with large quantities of running water
B. It should be neutralized with concentrated NaOH
C. The affect area should be wrapped tightly and shown to a medical health provider
D. It should be neutralized with concentrated KOH
E. It should be neutralized with solid $CaCO_3$

2. Match the materials in **list A** with the correct method of preventing it from rusting in **list B** by writing the letter of the correct answer in answer sheet provided

LIST A	**LIST B**
(i) Iron sheets	A. Alloying
(ii) Car bodies	B. Sacrificial protection
(iii) Motorcycle chain	C. Electroplating
(iv) Bridges and ships	D. Galvanization
(v) Handbag and camera	E. Oiling
(vi) Door locks	F. Tin plating
	G. Use of silica gel
	H. Painting

SECTION B (54 marks)

Answer **all** questions in this section

3. Give one reason for each of the given statement
   (i) Why petrol tanks in petrol station are constructed underground
   (ii) Laboratory door should open outward
   (iii) Laboratory floor is rough and never polished
   (iv) Some chemicals or reagents are stored in brown bottles
   (v) Why helium is preferred over hydrogen in filling weather balloons
   (vi) It is advisable to use an evaporating dish instead of conical flask to evaporate a solution

4. The following are the steps to follow in lighting of the Bunsen burner. However, the steps are not in the correct order. Re-write them in the correct sequence
   A. To extinguish the flame, turn off the gas tap to stop the gas flow
   B. Light the gas at the top of the barrel with a lighted match stick
   C. Turn off collar to close the air hole completely
   D. Keep your face away from the top of the barrel
   E. Adjust the gas tap until the supply of gas is enough for a flame
   F. Turn on the gas fully to ensure that plenty of the gas enters the burner

5. (a) Complete and balance the following chemical equations
   (i) $NaOH_{(aq)} + HCl_{(aq)} \longrightarrow$
   (ii) $FeSO_{4(aq)} + Cl_{2(g)} + H_2SO_{4(aq)} \longrightarrow$
   (iii) $Ca(OH)_{2(aq)} + H_2SO_{4(aq)} \longrightarrow$
   (iv) $Mg_{(S)} + HNO_{3(aq)} \longrightarrow$
   (v) $Pb(NO_3)_{2(s)} \xrightarrow{\Delta}$

   (b) Calculate the oxidation number of te underlined element in the following compounds

   (i) $\underline{Cu}SO_4$ (ii) $K\underline{Cl}O_3$ (iii) $\underline{S}O_4^{-2}$ (iv) $\underline{Na^+}$

6. (a) Two substances **R** and **S** were put in different beakers containing water to make their solutions. Damp litmus papers were then lowered into the formed solutions. Solution R turned damp litmus paper blue while solution S turned damp litmus paper red.
   i. Identify the solution which is acid and which is the base.
   ii. Basing on their physical properties, differentiate solution R from S (3 points)
   (b) The language communication among chemists is by using chemical symbols. By using three reasons explain the advantages of using chemical symbols in chemistry
7. (a) using Potassium Chlorate and Hydrogen Peroxide show how a gas that relights a glowing splint is formed

(b) A form one student put some iron wool into two bottle tops, she heated one of the samples of iron wool from the above using a blow pipe. The iron wool glown and the heated iron looted darker in colour and stiffer than the unheated iron wool. Explain why so happened

8. Classify the following salts on the basis solubility in water: Sodium carbonate, lead nitrate, silver chloride, copper (ii) sulphate, Barium sulphate, zinc chloride, lead sulphate, barium nitrate and calcium sulphate.

SECTION C

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

9. (a) Which statements in Dalton`s atomic theory are now considered to be incorrect and why? Give Four points.

(b) Explain the fact that several elements have more than one isotope, however their isotopes still exhibit similar chemical properties.

(c) A scientist wanted to discover relative atomic mass of potassium and chlorine atom. The scientist used mass spectrometer, potassium had the following information $^{39}K(93.3\%)$, ^{40}K (0.01%), $^{41}K(6.66\%)$ while the isotopes of chlorine had the following data of isotopes $^{35}Cl(75\%)$, $^{37}Cl(25\%)$. Calculate the relative molecular mass of potassium chloride.

10. One day Mr. Issa was suffering from heartburn. He decided to take in some wood ashes solution, after few hours he got relief
    (a) Name the process that took place in his stomach
    (b) Explain six applications of the process named above in everyday life
11. Hydrogen gas is a very promising energy source yet its use a major source of energy are very limited. Explain this in terms of its storage, safety and production
    (a) Briefly describe the methods of large scale production of hydrogen Gas
    (b) Explain the Origin of the term Hydrogen
    (c) The properties of the hydrogen gas relates to its uses. Explain by giving four points