

**PRESIDENT'S OFFICE.**  
**REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT.**  
**SINGIDA MUNICIPAL COUNCIL.**  
**FORM FOUR PRE NATIONAL EXAMINATION.**  
**CODE: 032/1 \_CHEMISTRY- 1.**

**TIME : 3 HOURS**

**INSTRUCTIONS:-**

- ☐ *This paper consists of section A, B and C with a total of eleven (11) questions.*
- ☐ *Answer all questions in sections A and B, and only two questions from section C*
- ☐ *Write your Examination number on every page of your answer sheet*
- ☐ *Non-programmable calculators are allowed in the examination room*
- ☐ *The following constants may be used:-*

*Atomic masses: H = 1, O = 16, C = 12, N = 14, Cl = 35.5, Ag = 108*

*Avogadro's number =  $6.02 \times 10^{23}$*

*G.M.V at STP =  $22.4\text{dm}^3$*

*1 Faraday = 96500 Coulombs*

*Standard pressure = 760mmHg*

*Standard temperature = 273k*

*1litre =  $1\text{dm}^3 = 1000\text{cm}^3$*

**SECTION A (16 MARKS)**

Answer **all** questions in this section

1. For each item (i) - (x), choose the correct answer from the given alternatives and write the letter besides the item number in the answer sheet:
  - i) The solution with  $\text{pH}$  of 5 is said to be
    - A. Strong base
    - B. A neutral
    - C. A weak acid
    - D. A strong acid
    - E. A weak base
  - ii) Insoluble salts like Barium sulphate, generally can be obtained in the laboratory by:-
    - A. Evaporation of its concentrated solution
    - B. Crystallization
    - C. Precipitation
    - D. Decomposition
    - E. Displacement
  - iii) In an experiment, 1930 coulombs liberated 0.64g of copper when the same quantity of electricity was passed through a solution of silver nitrate. What amount of silver was deposited
    - A. 32g
    - B. 2.16g
    - C. 108g
    - D. 10.80g
    - E. 21.60g
  - iv) When sand and wax are put in the same container and some volume of petrol is added, after few minutes sand is seen. Why wax is not seen after addition of petrol?
    - A. Because wax is insoluble in petrol
    - B. Because the mixture reached the equilibrium
    - C. Because petrol is flammable
    - D. Because wax is soluble in petrol

- E. Because sand dissolve in petrol
- v) In blast furnance carbon monoxide is prepared by passing carbondioxide over a red hot coke. What is the chemical role of carbondioxide?
- A. An accelerator  
B. An oxidizing agent  
C. A reducing agent  
D. A catalyst  
E. Flammable
- vi) Ethanol react with ethanoic acids to form a group of organic compounds
- A. Alkynes  
B. Haloalkanes  
C. Esters  
D. Alkenes  
E. Alkanes
- vii) A form one student dissolved one mole salts M into water and the solution was tested by litmus paper. The salt was found to change blue litmus paper to red. This salt is likely to be;
- A. Normal  
B. Complex  
C. Basic  
D. Acidic  
E. Neutral
- viii) If Fatma wants to electroplate a spoon with copper by using copper (ii) sulphate solution. She should arrange the electrodes as
- A. Spoon as anode and copper as cathode  
B. Spoon as cathode and copper as anode  
C. Spoon as anode and carbon as cathode  
D. Spoon as cathode and copper sulphate solution  
E. Spoon as copper solution
- ix) The following shows the four uses of iron in which of these uses are the iron mostly likely to rust
- A. Iron bucket electroplated with zinc  
B. Iron wired aluminium  
C. electric cable  
D. Alloyed piston  
E. Painted iron gate
- x) The reason why white anhydrous copper (ii) sulphate turns blue when exposed in atmosphere is that it
- A. Absorb with moisture  
B. React with oxygen  
C. React with carbon dioxide  
D. Becomes dry  
E. Release water to the atmosphere

2. Match the items in LIST A with the responses in LIST B by writing the letter of the correct responses in LIST B besides the item number in the answer booklet provided

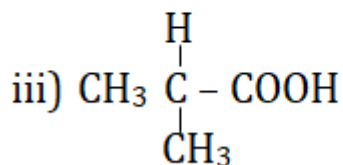
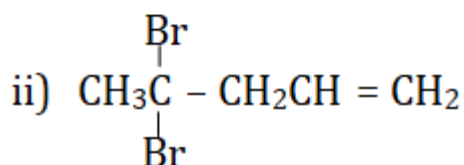
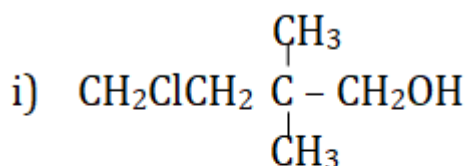
Column A	Column B
i) A colourless gas which is slightly soluble in water, neutral to litmus paper but used as fuel	A. Oxygen
ii) It supports plant survive but less important to combustion	B. Nitrogen
iii) A greenish gas denser than air and used as military weapon since it is poisonous	C. Sulphur dioxide
iv) It is colourless acidic gas with pungent chocking smell, used to control $P^H$ in chemical process	D. Hydrogen chloride
v) A non-poisonous gas physically isolated from air and used to	E. Carbon dioxide
	F. Flouride
	G. Ammonia
	H. Hydrogen

make fertilizer vi) It has strong choking smell of urine	I. Chlorine
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### **SECTION B (54 MARKS)**

**Attempt all questions in this section**

3. (a) Explain how the following differ from one another
  - i) A base and Alkali
  - ii) An atom and isotope
- (b) An organic compound P consists of 52.2% of carbon 13% of Hydrogen and 34.8% of oxygen. The vapour density of p is 23. Calculate the molecular formula of the compound.
- (c) Calculate the oxidation number of nitrogen in potassium nitrate
4. (a) Form four students of Mwanza secondary school went for tour studies at Refinery industry, the technician of the industry did not explain the terms below clearly. You as form four student give clarification about these terms..
  - i) Cracking
  - ii) Homologous series
  - iii) Functional group
  - iv) Esterification
- (b) Giving two reasons explain why carbon is found in all organic compounds?
- (c) Name the following compounds according to IUPAC system



5. 5.3g of  $\text{X}_2\text{CO}_3$  was dissolved in water to make 0.5 litre of a solution.  $25\text{cm}^3$  of this solution required  $50\text{cm}^3$  of 0.1m HCl for complete reaction
  - i) Write the balanced chemical equation for the neutralization reaction
  - ii) Calculate the concentration of  $\text{X}_2\text{CO}_3$  in moles  $\text{dm}^{-3}$
  - iii) What is the relative molecular mass of  $\text{X}_2\text{CO}_3$
  - iv) Give the name of element X

6. (a) A green solid sample A on heating gave off gas B which turns lime water milky and a black solid C remained. Solid C in warm dilute sulphuric acid forms a blue solution D
- Give the chemical formula of compound A, B, C, D
  - Write a balanced chemical equation for the reaction when a green solid A is heated
- (b) Describe what is observed when concentrated sulphuric acid is added to;
- White sugar
  - Hydrated copper (ii) sulphate
  - Sulphur
7. (a) (i) Ammonium sulphate is used as **fertilizer** to add nitrogen into the soil. What is meant by the fertilizer in chemistry?
- (ii) What are the three effects of excessive nitrogen to plants?
- (b)(i) State four (4) methods of application of fertilizers
- (ii) What are the four (4) advantages of using manure in the farms
- (iii) Calculate the percentage composition of nitrogen in ammonium sulphate fertilizer  $(\text{NH}_4)_2\text{SO}_4$
8. (a) Preventing rusting, you should prevent contamination of water and air with iron and steel, also to avoid using materials made from iron or steel. State the method that can be used to prevent rusting on each of the following
- Iron sheet
  - Bridge and pipelines
  - Ship
  - Machine parts
- (b) Fire extinguisher is the one which is used to stop fire to continue. List five types of fire extinguishers.

### **SECTION C (30 MARKS)**

#### **Answer only two questions**

9. A form four student had a task to mop the laboratory chamber, accidentally bees attacked and bite on her hand. The technician advised to apply ashes powder to the bite surface. Explain five importance of the process taking place on the skin surface to our daily life after applying the ashes powder.
10. We have coal at Kiwira in Mbeya Region. Authorities in the government have allowed using of coal for domestic and industrial purpose. What warning can you raise concerning likely effects? Give five points.
11. (a) When I was in an interview at a certain school, one student asked me to state Faraday's laws of Electrolysis. If you were me how could you answer that student?
- (b) Dilute silver nitrate solution was decomposed by the passage of electric current through it. What mass of silver and what volume of oxygen (measured at STP would be liberated in electrolysis by 9650 Coulombs of Electricity)