



**MOROGORO MUNICIPALITY**  
**KITANCHLA JOINT EXAMINATION**  
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**PRE MOCK FORM FOUR**



032/1

CHEMISTRY 1

**TIME: 3HRS**

**MARCH, 2025**

**Instructions**

1. This paper consists of section A, B and C with a total of (11) question
2. Answer all questions in section A and B and only two questions in Sections C
3. Sections A carries 16 marks, Section B carry 54 marks and Section C carries 30 marks
4. Write your examination number on every page of your answer sheets.
5. The following constants may be used:

Atomic masses; H = 1, S=32, O=16, Na = 23, Mg = 24, Ca = 40, Cl = 35.5, C = 12,  
Pb = 207, CU = 64, N = 14, Ag= 108

Avogadro's constant =  $6.022 \times 10^{23}$

Molar volume at STP =  $22.4 \text{ dm}^3$  or  $22400 \text{ cm}^3$

1Litre =  $1000 \text{ cm}^3$  –  $1 \text{ dm}^3$

Coulomb constant,  $1F = 96500C$

## SECTION A (16 Marks)

Answer all questions in this section

1. For each of the items (i) –(x) choose the correct answer from among the given alternatives and write its letter on the answer sheet provided.

- (i) The elements/ions with the same number of electrons in their outer most shells are
  - A. Ne,  $\text{Mg}^{2+}$  and  $\text{N}^{3-}$
  - B. Li,  $\text{Na}^+$  and K
  - C. Ca, K and Ar
  - D. Be, C and  $\text{Mg}^{2+}$
  - E. H, He and Li
- (ii) The best example which describes the very slow reaction is
  - A. Formation of silver chloride
  - B. Formation of hydrated iron (III) oxide
  - C. Reaction between marble chips and dilute hydrochloric acid
  - D. Reaction of sodium thiosulphate and dilute mineral acid
  - E. Reaction of Zinc and dilute hydrochloric acid
- (iii) Which one of the following substances takes the shape of the container?
  - A. Gas
  - B. Crystal
  - C. Liquid
  - D. Solid
  - E. Vapour
- (iv) How many hydrogen molecules are there in  $1.12\text{dm}^3$  of hydrogen gas at STP?
  - A.  $2.01 \times 10^{22}$  molecules
  - B.  $3.011 \times 10^{22}$  molecules
  - C.  $1.12 \times 10^{23}$  molecules
  - D.  $6.02 \times 10^{23}$  molecules
  - E.  $60.2 \times 10^{23}$  molecules
- (v) In Down's cell, a chemical substance which is normally added to lower the melting point is
  - A. Coke
  - B.  $\text{Ca}(\text{OH})_2$
  - C.  $\text{CaCl}_2$
  - D. NaCl
  - E. NaOH
- (vi) Carboxylic acid reacts with Sodium Carbonate to form salt, water and gas Q. The gas Q can be tested by using
  - A. Unhydrous Copper (II) Sulphate
  - B. A glowing wooden splint
  - C. Calcium hydroxide
  - D. Silver Nitrate
  - E. Blue Cobalt Chloride paper
- (vii) Asha wants to prepare a solution whose concentration is 0.4M from  $100\text{cm}^3$  of 2M hydrochloric acid. How many times should the solution be diluted?
  - A. Six times
  - B. Five times
  - C. Twenty times
  - D. Ten times
  - E. A half times

- (viii) Mwajuma got an accident when she was in the kitchen with hot porridge, the name given to such kind of burning is called
- Injury
  - Wound
  - Scar
  - Scald
  - Swollen burn
- (ix) The empirical formula of the iron oxide produced when 44.8g of iron reacts with 19.2g of oxygen is
- FeO
  - Fe<sub>2</sub>O<sub>3</sub>
  - FeO<sub>3</sub>
  - Fe<sub>2</sub>O
  - Fe<sub>2</sub>O<sub>4</sub>
- (x) An apparatus designed for preparing a small volume of gas in the laboratory is known as
- Desicator apparatus
  - Gas jar apparatus
  - Kipp's apparatus
  - Flat/round bottomed flask apparatus
  - Beehive apparatus

|   |    |     |    |   |    |     |      |    |   |
|---|----|-----|----|---|----|-----|------|----|---|
| i | ii | iii | iv | v | vi | vii | viii | ix | x |
|   |    |     |    |   |    |     |      |    |   |

2. Match the description in List A with corresponding in list B by writing the letter of the correct response beside the Item number in the answer booklets provided.

| LIST A |                        | LIST B |                           |
|--------|------------------------|--------|---------------------------|
| (i)    | Baking soda            | A.     | Calcium chloride          |
| (ii)   | Gypsum                 | B.     | Calcium carbonate         |
| (iii)  | Chalk                  | C.     | Hydrated calcium sulphate |
| (iv)   | Plaster of Paris (POP) | D.     | Calcium sulphate          |
| (v)    | Bleach                 | E.     | Sodium bicarbonate        |
| (vi)   | Common Salt            | F.     | Sodium chloride           |
|        |                        | G.     | Sodium hypochlorite       |
|        |                        | H.     | Sodium hydroxide          |
|        |                        | I.     | Milk of magnesia          |
|        |                        | J.     | Chloroform                |

|   |    |     |    |   |    |
|---|----|-----|----|---|----|
| i | ii | iii | iv | v | vi |
|   |    |     |    |   |    |

## SECTION B (54 Marks)

### Answer all questions

3. (a) Form One students at Little Angels Secondary School wanted to separate salt from salt and sugar mixture, they mixed the mixture in water but they completely failed to separate them.
- Why do you think the use of water is not best approach on salt and sugar separation?
  - You as an expert on separation of mixture, help them to separate sugar and salt.

- (iii) Explain any special safety precaution you will take during separation.
- (b) Describe three ways of separating the solid from the liquid in a suspension.

4. Briefly explain the following statements: -

- (a) Hydrogen gas is collected by downward displacement of water.
- (b) An atom is electrically neutral
- (c) Most of the anode electrodes commonly used are inert in nature.
- (d) Alumina ( $\text{Al}_2\text{O}_3$ ) cannot be reduced to aluminum metal by carbon.
- (e) Carbon can be considered as unique in its chemical properties as it can form many compounds.

5. (a) A chemistry teacher was teaching the Chemical Equilibrium and appointed you to explain two conditions necessary for system to be in the equilibrium. Briefly perform the task given.
- (b) Water at  $25^\circ\text{C}$  was used to dissolve two compounds. Immediately after the compounds had dissolved, the temperature of each solution was measured as shown in the figure below: -

| S/N | COMPOUND | TEMPERATURE/ $^\circ\text{C}$ |          |
|-----|----------|-------------------------------|----------|
|     |          | Water                         | Solution |
| 1   | A        | 25                            | 15       |
| 2   | B        | 25                            | 45       |

- (i) Which compound dissolved exothermically? Give reason(s)
- (ii) Which compound dissolved endothermically? Give reason(s)
- (iii) Draw the energy level diagrams for (b) i and ii above.

6. (a) Distinguish the following pairs

- (i) Cation and anion
- (ii) Deliquescent salt and efflorescent salt

(b) Element K having atomic number 12 combine with element M having atomic number 17 to form a certain compound. The letters are not actual symbols of the given element.

- (i) Use the given letters, write the formula of the compound and state the type of bond formed in the compound formed.
- (ii) How the electronic configurations used to determine the valency, period and group of the elements? Use Magnesium and Chlorine as the examples in your explanation.

7. (a) Explain the following; -

- (i) Why group one elements are called alkali metals?

- (ii) Why non metals are called oxidizing agents?
  - (iii) Atomic size increases as moving down the group.
  - (b) The reaction between dilute hydrochloric acid and sodium thiosulphate result into production of white precipitate which cause the opaque of the solution. Explain the uses of solid substance that causes opaqueness in the following areas: - Treatment of diseases, Agriculture, automobile and military.
8. (a) What do you understand by the term Spectator ions?
- (b) Study the following chemical reaction and then answer the questions that follow: -
- $$3\text{KOH}_{(\text{aq})} + \text{FeCl}_{3(\text{aq})} \rightarrow 3\text{KCl}_{(\text{aq})} + \text{Fe}(\text{OH})_{3(\text{s})}$$
- (i) What type of a reaction is represented by the above reaction?
  - (ii) Write the total ionic equation for the reaction.
  - (iii) Write the net ionic equation for the reaction.
- (b) How many faradays of electricity must be passed to deposit 2.16g of silver metal?

### SECTION C (30 Marks)

Answer only two questions from this section

9. (a) How do plants cause weathering?
- (b) Explain how each of the following climatic factors influence soil formation?
- (i) Temperature (ii) Wind (iii) Rainfall
10. (a) Volumetric analysis is the analytical method based on measurement of the volume of a solution required to react completely with definite volume of another solution. The processes in it can be associated with several challenges. Explain those challenges and the ways used to fix them. (five points)
- (b) Explain the applications of volumetric analysis in daily life situations. (Three points)
11. (a) Explain whether the following organic compounds are correctly named, and give the correct names for the incorrect ones: -
- (i) 1,1,3-trimethylpropane
  - (ii) 2-bromomethylpropane
  - (iii) 2-ethylbutane
  - (iv) 1-methylpentane
- (b) (i) What is the isomerism?
- (ii) Butane has higher boiling point than that of ethane. Give reason
- (c) Write all possible isomers of  $\text{C}_5\text{H}_{12}$