

PRESIDENT'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT
KIBAHA DISTRICT COUNCIL



DISTRICT FORM FOUR MOCK EXAMINATION

CODE: 032/1

CHEMISTRY 1

TIME: 3:00 HOURS

2025

Instructions

1. This paper consists of three sections **A**, **B** and **C** with a total of **ten (11)** questions
2. Answer all questions in sections **A** and **B** and only two (2) questions in section **C**
3. Section **A** carries a total of **16 marks**, section **B** carries **fifty four (54) marks** and section **C** carries **thirty (30) marks**.
4. Non-programmable calculators may be used
5. Communication devices and any unauthorized materials are not allowed in the examination room
6. The following constants may be used;-

Mg= 24, Ca = 40, Cl= 35.5, S= 32, H= 1, K= 39, Cl= 35.5, F= 96500C,

SECTION A (16Marks)

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

(i) A typical example of a salt that dissociates in water to form three different types of ions

- | | |
|--|---|
| A. $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ | D. $(\text{NH}_4)_2\text{SO}_4 \cdot \text{FeSO}_4 \cdot 6\text{H}_2\text{O}$ |
| B. $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$ | E. KHSO_4 |
| C. $\text{Mg}(\text{HCO}_3)_2$ | |

(ii) Which physical method can be used to separate the products

of the following reaction; $\text{BaCl}_{2(\text{aq})} + \text{Na}_2\text{SO}_{4(\text{aq})} \longrightarrow \text{BaSO}_{4(\text{s})} + \text{NaCl}_{(\text{aq})}$

- | | |
|-------------------|-----------------|
| A. Evaporation | D. Sublimation |
| B. Filtration | E. Distillation |
| C. Chromatography | |

(iii) Which property is used to confirm the presence of water vapour in air?

- | | |
|------------------------------------|---|
| A. It freezes at 0°C | D. It turns white anhydrous copper (ii) sulphate blue |
| B. It dissolves all substances | E. It turns lime water milk |
| C. Its neutral to litmus paper | |

(iv) In which type of oxide does ZnO belong?

- | | |
|---------------------|------------------|
| A. Metal oxide | D. Basic oxide |
| B. Amphoteric oxide | E. Soluble oxide |
| C. Compound oxide | |

(v) The organic compounds having the same molecular formula but have different structural formula are

- | | |
|--------------|----------------------|
| A. Isomerism | D. Homologous series |
| B. Isomers | E. Isotropy |
| C. Allotropy | |

(vi) What mass of potassium chloride is required to prepare 250cm^3 of 0.235M ?

- | | |
|----------|----------|
| A. 9.23g | D. 15.6g |
| B. 31.3g | E. 43.8g |
| C. 4.38g | |

(vii) The correct sequence for the main stages involved in the extraction of metals from their chief ores include

- A. Mining and concentration, refining, reduction and roasting
- B. Refining, roasting, purification and concentration
- C. Mining and concentration, roasting, reduction and purification
- D. Roasting, refining, concentration and mining
- E. Concentration, mining, roasting, reduction and refining

(viii) Metals are good reducing agents because

- A. They gain electron(s) from other species
- B. They accept electron(s) from other species
- C. They supply electron to other species
- D. They are reduced during redox reaction
- E. They are reductants

(ix) Which of the following compound will not give a metal oxide on heating?

- A. Silver nitrate
- B. Lead nitrate
- C. Zinc nitrate
- D. Calcium nitrate
- E. Copper nitrate

(x) The major component of photochemical smog is

- A. Ozone
- B. Sulphur dioxide
- C. Carbon dioxide
- D. Nitrogen dioxide
- E. Particulate matter

2. Match the types of organic manure in list A with the respective composition of each type of manure in list B by writing the letter of the correct response beside the items number.

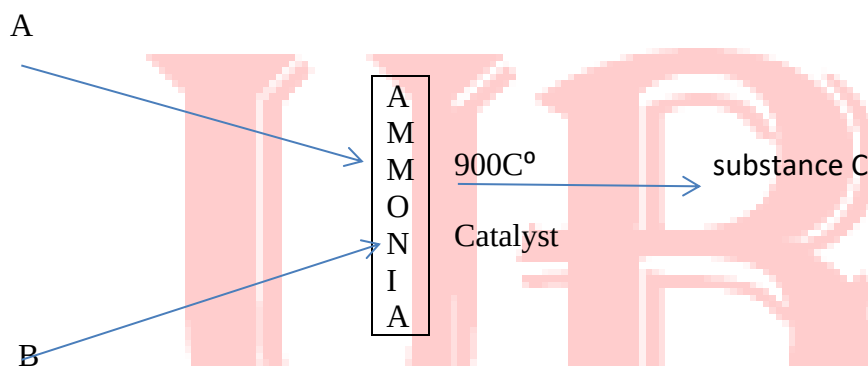
List A	List B
i. A colourless gas which is slightly soluble in water, neutral to litmus paper but used as the rocket fuel	A. Oxygen
ii. It supports plant survive but less important to combustion	B. Nitrogen
iii. A greenish gas denser than air and used as military weapons since it is poisonous	C. Sulphur dioxide
iv. It colourless acidic gas with a pungent choking smell, used to control pH in chemical process	D. Hydrogen chloride
v. A non-poisonous gas physically isolated from air and used to make fertilizer	E. Carbon dioxide
vi. It has a strong choking smell of urine	F. Fluoride
	G. Ammonia
	H. Hydrogen
	I. Chlorine

SECTION B (54marks)

3. (a) What is the purpose of using warning signs on the containers of chemicals in the laboratory?
(b) Compare the properties of covalent and electrovalent compounds on the following points:

- (i) State at room temperature
- (ii) Melting and boiling points
- (iii) Solubility
- (iv) Electrical conductivity

4. (a) the flow chart below shows the process that can be used to obtain substance C from ammonia gas when heated to about 900°C in air and in the presence of a catalyst.



- i. Ammonia is obtained on large scale by Haber process. Name the raw materials A and B
 - ii. Name the substance C and the catalyst used
 - iii. Write an equation to show the product formed when C is cooled in the presence of air
- (b) Solid sodium oxide was dissolved in water to form a solution R. A portion of solution R was evaporated to dryness to obtain residue T. the other portion R was added to aqueous copper (ii) sulphate solution. A blue precipitate was formed.
- i. Identify the residue T
 - ii. Name the ions present in the blue precipitate
- 5.(a) Distinguish between titrant from analyte as applied in volumetric analysis.
- (b) The hydroxide of a metal M reacts with hydrochloric acid as follows:
- $$\text{M(OH)}_{2(\text{aq})} + 2\text{HCl}_{(\text{aq})} \rightarrow \text{MCl}_{2(\text{aq})} + 2\text{H}_2\text{O}_{(\text{l})}$$
- It was found out that 5.8 g of M(OH)_2 reacted with 0.2 M hydrochloric acid.
- Calculate the
- (i) Molar mass of M(OH)_2
 - (ii) Atomic mass of M
 - (iii) Suggest the name of the metal M.

- (c) The general formula of a homologous series of organic compound is C_nH_{2n-2}
- Name and draw the structural formula of the fourth member in this series
 - Give one isomer of the fourth member of this series
6. (a) briefly explain the following
- Sodium is extracted by the electrolysis of a molten sodium chloride and not aqueous sodium chloride
 - Sodium metal is kept under paraffin
 - An aqueous solution of iron (ii) ions turns brown when exposed to air
- (b) 0.22g of metal P is deposited by electrolysis when a current of 0.06 amperes flows for 99 minutes.
- Find the number of moles of electrons passed
 - Find the number of moles of the metal P deposited
 - Determine the value of n in the metallic ion P^{n+}
7. a) Explain why soap does not form lather easily with hard water at first but eventually forms the Lather?
- b) With the aid of chemical equations, briefly describe the following process
- The removal of temporary hardness of by boiling
 - The removal of permanent hardness of water chemical means
- (c) Giving two points in each case, explain the advantages and disadvantages of hard water
8. A solution of sodium hydroxide is added to a solution of hydrochloric acid.
- Given that both solutions are at room temperature what type of reaction takes place if the final temperature of the reaction mixture is $36^{\circ}C$?
 - Draw an energy level diagram for the reaction
 - State four application of the reaction above in our daily life

SECTION C

Answer only two questions (30 marks)

9. The extraction of metals has economic advantage in Tanzania, but it's still destructive to the environment. Illustrate three (3) environmental destructions may be caused by the process, and suggest three (3) control measure to problem.
10. Agriculture is backbone of our economy" but the addition of inorganic fertilizers in the farm is not as important as addition of organic manure. Discuss the correctness of this statement in four points.
11. (a) Despite of its corrosiveness, sulphuric acid is very important in industry, is manufactured in large scale through contact process, with aid of balanced chemical equation explain stages in

industrial manufacturing of sulphuric acid by contact process

(b) With three (3) reasons explain why sulphuric acid is important.

UB