

THE PRESIDENT'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT
UKEREWE DISTRICT COUNCIL



FORM THREE EXAMINATION
CHEMISTRY

1.

I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.
A	C	D	D	B	B	D	D	D	

10 marks

2.

I.	II.	III.	IV.	V.	VI.
C	D	B	A	E	F

06marks

1. (a) Uses of metals: (@ 1 marks) =4 marks

- i. Electrical wiring (good conductors)
- ii. Cooking utensils (high melting points)
- iii. Building materials (strong and malleable)
- iv. Coins and jewelry (lustrous and durable)

(b)

- Steam engine
- Water cycle
- Refinery
- Metallurgy
- Drying material
- Production of electricity **1Mark @ =05Marks**

2. a. Mole refers to amount of substances which contain as many elementary particulate entities as there are atoms in 12g of carbon – 12.

1.5marks

b.

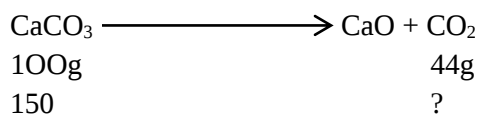
- Stoichiometry
- Determination of percentage purity

- Determination of empirical formulae
- Determination of molecular formulae

4marks

c. Data given

Mass of $\text{CaCO}_3 = 150\text{g}$



$$150 \times 44 / 100$$

$$= 66\text{g}$$

$$66\text{g} / 44 = 1.5\text{mol}$$

$$n = v / \text{GmV}$$

$$= 1.5 \times 22.4$$

$$\text{volume} = 33.6\text{L}$$

3.5 marks

5. Hard water :- Is the water that does not form lather with soap. Is caused by dissolved salt including sulphates chlorides and hydrogen carbonates of calcium and magnesium.

Method used to make hard water safe and clean

- (i) **Boiling** : Boiling decompose calcium and magnesium hydrogen carbonates to form carbonates water and carbon dioxide gas. The calcium and magnesium ions are removed from water as insoluble carbonates and then deposited as solid at the bottom of boilers. Example $\text{CaHCO}_3 \xrightarrow{\text{Heat}} \text{CaCO}_{3(s)} + \text{H}_2\text{O}_{(L)} + \text{CO}_{2(g)}$
- (ii) **Addition of aqueous ammonia**. When aqueous ammonia is added to temporarily hard water the soluble hydrogen carbonates of magnesium and calcium are converted into insoluble carbonate. For example $2\text{NH}_4\text{OH}_{(aq)} + \text{Mg}(\text{HCO}_3)_2 \longrightarrow \text{MgCO}_3 + (\text{NH}_4)_2\text{CO}_3 + 2\text{H}_2\text{O}$
- When aqueous ammonia is added to permanent hard water the soluble sulphates or chlorides of magnesium and calcium are converted into hydroxide. For example $2\text{NH}_4\text{OH}_{(aq)} + \text{MgSO}_4 \longrightarrow \text{Mg}(\text{OH})_2 + (\text{NH}_4)_2\text{SO}_4$
- (iii) **Distillation**:- This process relies on evaporation by condensation to purify hard water. During distillation the hard water is heated to form steam which then cools and then condenses to form soft water.

- (iv) **Treatment with calcium hydroxide (lime water).** The soluble magnesium or calcium hydrogen carbonate react with calcium hydroxide to form insoluble magnesium carbonate or calcium carbonate and water. For example



- (v) **Use of washing soda (Na₂CO₃) :-** Sodium carbonate is added into water to form calcium carbonate or magnesium carbonate precipitate.



- (vi) **Use of ion exchangers:-** These treat bath temporary and permanent hardness by removing all the calcium and magnesium ions from water. **1.5 mark@=9marks**

6. (a) (i)

Q = Sodium carbonate Na₂CO₃ **01mark**

P= Carbondioxide **01mark**

(ii) Na₂CO₃ + 2HCl $\longrightarrow$ 2NaCl_(s) + CO_{2(g)} + H₂O_(L) **01mark**

(b)(i) Electrolyte are chemical substance decompose when electricity pass through it. **(1mark)**

(ii) Electrodes are poles in which electricity enter and leave electrolyte during **(1mark)** electrolysis. OR Are poles where ions are attracted for discharge during electrolysis.

(b) Factors affecting ions discharge during electrolysis are:-

- Position of ion in electrochemical series
- Concentration of ion
- Nature of electrode **(0.5mark@=1.5marks)**

(c) Faradays Laws of electricity; **(1.5mark@ =3 marks)**

First Faraday's law of electrolysis states that, "the amount of substance liberated or deposited on electrode during electricity is directly proportional to quantity of electricity passing through electrolyte" Mathematically; **M Q**

Second Faraday's Law of Electrolysis states that, "When the same quantity of electricity passing through different electrolyte, the amount of substance liberated or deposited on electrodes is directly proportional to chemical equivalent of an element"

7. (a) (i)– Iron ore or iron ore

-Limestone

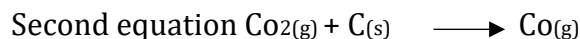
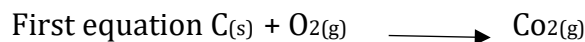
-Coke **0.5 mark @=1.5 marks**

(ii) Function of each

- Iron ore = reduced to get iron
- Limestone = remove impurities after decompose

- Coke = combine with oxygen to form carbon monoxide that act as reducing agent. **03marks**

(b) (i) Chemical equation



(ii) The two liquid are

1. Molten iron

2. Slag **0.5 mark@=1 mark**

8. (a) **Le - chartellier principle** state that . if the chemical system is in equilibrium and one of the factor is the equilibrium is altered the equilibrium will shift so as to tend to reduce the effect of change **02marks**

(b) (i) **Low temperature** :-

The forward reaction is exothermic reaction . this suggest that low temperature will yield high proportion of sulphur trioxide (SO_3) reaction will proceed to forward direction.

(ii) **High pressure / increase pressure:-**

According to le- chartellier's principle high pressure will produce a greater yield of sulphur trioxide. Reaction will shift to the right hand side because there is low number of mole **02marks**

(c). Temperature , pressure, concentration , catalyst, surface area and light. **05marks**

9.

- Introduction **01.5Marks**

- Main body

Melting

Freezing

Evaporation

Condensation

Sublimation

Deposition

2Marks@ =12Marks

- Conclusion

01.5Marks

10. Introduction **01.5Marks**

Main body

Reduce deforestation

Environmental conserversion

Cost effective
Improve sanitation
Produce organic fertilizer
Reduce greenhouse effect
It create employments

2Marks@ =12Marks

□ Conclusion

01.5Marks

11. Application of Neutralization (15 Marks)

Introduction 1.5 marks

Applications of acid-base reactions (6 points): *(2marks each)*

- i. Neutralizes excess stomach acid
- ii. Produces salt and water
- iii. Relieves pain and inflammation
- iv. Balances pH in body
- v. Prevents ulcers
- vi. Common in antacid tablets

Conclusion 1.5 marks