CHRISTIAN SOCIAL SERVICES COMMISSION (CSSC)
NORTHERN ZONE JOINT EXAMINATIONS SYNDICATE (NZ-JES)

FORM FOUR PRE – NATIONAL EXAMINATION AUGUST 2025

032/1 **CHEMISTRY 1**

MARKING SCHEME

1.

QN	i	ii	iii	iv	V	vi	vii	viii	ix	X
ANS	C	D	C	B	C	A	C	D	A	D

2.

Question	I	ii	Iii	iv	v	vi
answer	D	G	B	A	E	C

3. (a) (i) Neutralization (1mark)

(ii) Application of neutralization in daily life

- Treatment of insect bites (e.g wasp bite)
- Preparation of antacids to treat indigestion problems
- Treatment of soil acidity or alkalinity
- Preparation of salts in the laboratory **(4 points @1mark) (Total 4 Marks)**

(b) Examples of insoluble salts (two examples)

- Silver chloride (Agcl)
- Mercury (i) chloride (HgCl)
- Lead chloride ($Pbcl_2$)
- Calcium carbonate **(@1 mark (Total 2 Marks)**

4. (a) (i) Number of protons = 19 (1mark) Number of neutrons =20 (1mark)

(b) Chemical equation for the liberation of oxygen:- $2H_2O_{2(l)} \longrightarrow 2H_2O_{(l)} + O_{2\ (g)}$ (1mark)

At stp 2 moles of water are produced with 1 mole of 36g of water produced with 22400cm^3 of 0_2.

X g of water will be produced with 1120cm^3 of O_2 (1mark) X

$= \frac{36 \times 1120}{22400} = 1.8g$ (1mark)

Since density $= \frac{\text{mass of water}}{\text{volume of water}}$ (1mark)

Volume of water $= \frac{\text{mass of water}}{\text{Density of water}}$

$= \frac{1.8g}{1g\ cm^3} = 1.8\ cm^3$

Hence volume of water produced is 1.8cm^3 (1mark)

5. (a) (i) $Zn_{(s)} + H_2SO_4(aq) \longrightarrow ZnSO_{4(aq)} + H_{2(g)}$----------displacement ($^1/_2$ mark)

(ii) $AgNO_{3\ (aq)} + NaCl_{(aq)} \longrightarrow AgCl_{(s)} + NaNO_{3\ (aq)}$--------Double decomposition ($^1/_2$ mark)

(iii) $N_{2(g)} + 3H_{2(g)} \longrightarrow 2NH_{3(g)}$..... combination ($^1/_2$ mark)

(iv) $CaCO_{3(s)} \xrightarrow{HEAT} CaO(s) + CO_{2\ (g)}$..... Decomposition(½ mark)

(b) Given that I = 5A

m = 3.24g

$Z = 1.118 \times 10^{-3}C^{-2}$

t =?

Using m= Zlt ($^1/_2$ mark) t

$= \frac{m}{ZI}$

$t = \frac{3.24}{1.118 \times 10^{-3} \times 5}$ seconds

t = 549 seconds (01 mark)

6. a) (i) Catalyst is a chemical substance which changes the rate of chemical reaction but remains unchanged at the end of reaction. (2marks)

(ii) Haber process – finely ground iron (1mark) Contact process –Vanadium pentaoxide (1mark)

(b) (i) High pressure –would increase production of ammonia gas (ii)High temperature –would lower production of ammonia gas
(iii) would increase production of ammonia gas

7. (a) (i) Protons and neutrons @$^1/_2$mark (total 1mark)
Protons are positively charged while neutrons have no charge 1mark.
(ii) Electrons ½ mark

(b) Ions in solid $CaCl_2$ are bound (not mobile) but $CaCl_2$ in solution form, the ions are mobile to conduct electricity. 2marks

(c) Importance of carbondioxide for life on land:-
Carbondioxide facilitates photosynthesis which in turn produces food taken by animals, also photosynthesis produces oxygen gas important for the respiration in animals. 1$^1/_2$mark

8. (a) (i) Isomerism is the existence of organic compounds with same molecular formula but different structural formula. 1mark

(ii) Isomer of C_4H_{10}
$CH_3 - CH_2 - CH_2 - CH_3$ (butane) 1mark

$CH_3 - CH - CH_3$ (2-methylpropane) 1mark
I
CH_3

(b) (i) Alkanes
(ii) Alkenes
(iii) Alcohol
(iv) Alkynes @$^1/_2$mark (total 2marks)

(c) (i) $CH_{4\,(g)} + 2O_{2(g)} \longrightarrow 2H_2O + CO_{2(g)}$ (1mark)
(ii) $CH4_{(g)} + Cl_{2(g)} \longrightarrow C_2H_3Cl + HCl$ (1mark)

SECTION C

9. ANSWER:

Soil fertility is the ability of the soil to provide nutrients in proper and balanced quantities for the growth of plaints. A fertile soil should have the correct proportions of plant nutrients and 0ptimum PH. This help in increasing the productivity of the soil. The following are the ways in which soil losses its fertility.

Soil erosion:Is the carrying away of the top fertile soil by moving water and wind. It leads to loss of the fertile top soil and plant nutrients. This makes the soil infertile.

Monocropping:The practice of growing one type of crop on a piece of land for a long time. The crop uses only those nutrients it needs while other nutrients remain unused resulting to exhaustion of some nutrients and eventually to their deficiency in the subsequent years.

Leaching:The process through which water-soluble plant nutrients are washed into the lower layers of the soil and beyond the root zone. The nutrients become unavailable to plants.

Burning of vegetation: Organic matters are destroyed when burning vegetation and the activities of microorganisms like nitrogen fixation decomposition of organic matter become affected. Accumulation of the resulting ash also causes imbalance of nutrients in the soil.

Soil capping: Occurs when the soil is covered with an imperviours material which prevents the penetration of rain water into the soil. This denies the soil adequate moisture and exposes the soil to erosion.

Change in soil PH: Soil PH is the measure of acidity or alkalinity of the soil. The in appropriate application of fertilizers can change the soil PH which affects the activities of the soil microorganisms and the availability of some nutrients. Example, the use of acidic fertilizers over a long period of time can make the soil acidic.

Accumulation of salts: Soil water contains dissolved mineral salts from the parent rock. Under normal condition salts are washed away by rain water. In areas with irregular rainfall and poor drainage lead to accumulation salts below the soil surface which cause deficiency of water in plants as water moves out of the roots into the soil solution due to osmotic pressure.

Therefore, for a farmer to obtain high yields of crops should improve soil nutrients through addition of organic manure, crop rotation, contour farming planting vegetation covers and good harvesting practices. .

(Introduction 02 Marks, Main body 2@mark each=12marks, conclusion 1mark).

10. introduction 2marks

Points

(i) Reduce photosynthesis under water plants

(ii) Oxygen depletion

(iii) Production of toxins

(iv) Loss of biodiversity

(v) Unpleasant smell

(vi) Disrupt food web by favoring certain tolerant species and harming others

Points and good explanation 2mars=12marks

Conclusion=1mark

11. (a)Metals are extracted from the ores. An ore is naturally occurring solid materials(rocks)from which a Metals are extracted. (1/2)mark

Hints: four stages of extraction metals from their ore

(i) Concentrating the ore; This involve the removal of impurities from the metal ore without decomposing the ore chemically.The main impurities at this stage are sand,limestone and silicates (03)marks

(ii) Roasting of ore;This is the process in which the ore is heated in presence of air usually at temperature below the melting point of the ore.(03 marks)

(iii) Reduction;This is used for oxides obtained after roasting.The choice of the reducing method depends on the possition of the metal on the electrochemical series.(03 marks)

(iv) Refining/purification;Metal obtained through reduction are generally impure,their know as crude metals.The crude metals can be purified by three main methods such as distillations, Oxidation and eletro-refining.(03 marks)

(b)Extraction of Gold does not follow all four stages of extraction of metals.The extraction of gold is done only through the last procedure (purification of the metal). This is because gold is a very unreactive and so it occurs as free uncombined element.(02marks)

Any reasonable conclusion (1/2 mark)