CHRISTIAN SOCIAL SERVICES COMMISSION (CSSC)

NORTHEN ZONE JOINT EXAMINATIONS SYNDICATE (NZJES)

FORM FOUR PRE-NATIONAL EXAMINATIONS AUGUST 2024

CHEMISTRY 1

MARKING SCHEME

Qn 1.

i	ii	Iii	iv	v	vi	Vii	viii	ix	x
B	B	D	B	C	B	D	B	B	C

01@=10

Qn 2.

LIST A	I	ii	iii	iv	V	vi
LIST B	C	A	B	G	F	D

01@= 06

SECTION B (54 MARKS)

Qn 3. (a) (i)Gas 'A' is hydrogen and Gas 'B' is oxygen 01marks@**total 02marks**

(ii)Gas B is collected by downward displacement of water. **01mark**

Reasons **.** It is slightly soluble in water **1½ marks**

. It is slightly denser than air **1½ marks**

(b)(i)in agriculture is used to make fertilizers **01 ½ marks**

(ii) in construction it is used in construction of tarmac roads **1½ marks**

Qn. 4. (a)(i)The catalyst is Vanadium (V) Oxide (V_2O_5) or Platinum **01marks**

(ii)Equation: $SO_2 + O_2 \rightleftharpoons SO_3$ **01marks**

$SO_3 + H_2O \rightleftharpoons H_2SO_4$

(iii)The compound is fuming sulphuric acid (OLEUM) **01marks**

(b)(i)Uses of sulphur in automobile industry:

Sulphur is used in vulcanization of natural rubber which is used in making car tyres. **02 marks**

(ii)Uses of suphur in treatment of diseases: **02 marks**

Sulphur is used in the manufacture of useful organic materials such as antifungal compounds.

(iii)Uses of sulphur in agriculture: **02 marks**

It used to dust vines and cashew to prevent the growth of fungus.

Qn5. (a)Solid A is copper (II) carbonate ($CuCO_3$**)**

01mark

Gas B is carbon dioxide (CO_2); $CuCO_3 \longrightarrow CuO + \mathbf{CO_2}$

01mark

A black Solid C is Copper (II) Oxide (CuO)

01mark

A blue solid D is hydrated copper (II) sulphate ($CuSO_4.5H_2O$)

01mark

$CuSO_4.5H_2O \longrightarrow CuO_{(s)} + H_2SO_{4(aq)}CuSO_{4(aq)} + H_2O)_{l)}$

01mark

(b)Importance of conserving the environment:

(i)It helps to sustain human lives since it contains natural resources such as water, air and soil.

(ii)It helpa to protect animals and plants

(iii)It is important for the future generation.

(iv)It is for economic values such as mineral and agriculture.

(v)The natural resources give the environment a sense of beauty e.g forests.

(any four points)01@=**04marks**

Qn. 6. (a) (i) Three substance that do not conduct electricity are:

- S
- plastic **1½ marks**
- wood

(ii) Four substance that conduct electricity are:

- Pb
- Cu **2 marks**
- C
- Mg

(iii) C **½ marks**

(iv)-$NaCl_{(aq)}$, $NaOH_{(aq)}$ and $CuCl_{2(aq)}$ any one **½ marks**

(v) $NaCl_{(aq}$ and $CuCl_{2(aq)}$ any one **½ marks**

(b) X +2+24+22 =100

X 52% **1marks**

RAM of H = $\sum(\frac{isotopic\ mass\ x\ abundance\ )}{total\ abundance}$ **1marks**

$207 = \frac{(204 \times 2) + (208 \times 24) + (207 \times 22) + (A \times 52)}{100}$ **1marks**

$20700 = 408 + 4992 + 4554 + 52A$

$20700 = 9954 + 52A$

$A = 206.65$ **1marks**

7. (a)

(i)This is because when air hole is open enough air enters the tube and this allow complete burning

of the gas. **01marks**

(ii)This is because they both change to vapour at the same temperature. **01mark**

(iii) This is because glass are transparent to observe colour changes. **01mark**

(b)(i) Carbondioxide, Sulphur dioxide, Chlorofluro carbons and Nitrogen dioxide

(ii) Mining activities, Agricultural activities

8. The equilibrium move to the right hand side because the reaction is endothermic reaction **03marks**

(b) The colour of the mixture will change from brown to yellow as itfavour the backward Reaction **03marks**

(c) Lechatelier's principal which state that if a system at equilibrium is subjected to a change, processes will occur which tend to counteract the change imposed. **03marks**

SECTION C (30 MARKS)

9

Introduction : any relevance (1.5marks)

Main body should contain any application of neutralization reaction in our daily lifelike the following

-neutralize the excess acid in stomach

-used in waste treatment

-used to control the pH of the soil

-used to cure the wasp stings (insect stings)

-used to treat the accidental spills of concentrated acid or base (chemicals)

-prevent acidic rain formation

-manufacture of fertilizer **(any 6 point @ 2mark)**

Conclusion: any relevance conclusion **(1.5 marks)**

10. (a)

Symbol	**C**	**H**
% composition	80	20
R.A.M	12	1
Divide % composition by R.A.M	80/12 = 6.67	20/1 = 20
Divide obtained values by smallest value	6.67/6.67 = 1	20/6.67 = 2.99
Approximate the obtained value into whole number	1	3

Therefore, empirical formula = CH_3

Require molecular formula

R. M. M = Vapour density x 2 = 15 x 2

R. M. M = 30

But R.M.M = n x empirical formula

30 = n (12 + 1 x 3)

$\frac{30}{15} = \frac{15n}{15} = 2$

Molecular formular = 2 x(CH_3)

Therefore molecular formula = C_2H_6

(b) $C_2H_6 + Br_2 \xrightarrow{UV} \underset{B}{C_2H_5Br} + HBr$

$\underset{B}{C_2H_5Br} + KOH \rightarrow \underset{C}{C_2H_5OH} + KBr$

$\underset{C}{CH_3CH_2OH} + Kmno_4/H^+ \rightarrow \underset{D}{CH_3COOH}$

$CH_3CH_2OH + CH_3COOH \underset{}{\overset{H^+}{\rightleftharpoons}} \underset{E}{CH_3COOCH_2CH_3} + H_2O$

(c) Harmful effects of alcohol (C) ($\frac{1}{2}$ $each\ total\ 2\ marks$)

- Lead to addiction
- Neglecting families and other relationship
- Violence and crimes
- Damage of liver and heart
- Damage of brain cell
- Affect optic nerves
- Develop anaemia
- Cause impotence to mate and frigidity to female

11. Introduction Any relevance about macro-and micro-nutrients (1.5marks)

Main body should contain any six ways of maintaining soil nutrients, point 01 mark and explanation 01 mark

-crop rotation

-prevention of soil erosion

-good harvesting practices

-controlled grazing

-mixed cropping

-use of manure

-minimum tillage

Conclusion (1.5 marks)