MUHANGA DISTRICT

SECOND TERM CHEMISTRY EXAMINATION FOR SENIOR THREE

DURATION: 3HOURS

This Exam paper is composed of Three Sections (A, B, C). Follow the instructions given below, and answer the indicated questions for a total of 100marks

Section A: Eleven (11) Questions, all Compulsory. 55 marks

Section B: Four (4) questions, Attempt any 3 Questions of your choice. 30 marks

Section C : Is compulsory /15 marks

Section A: Eleven (11) questions all Compulsory. 55 marks

Qn1 :Circle the correct answer in each of the following questions:

i) Which of the following carriers fits better with someone who graduated in chemistry? (1mark)

a.Pharmacist

b.Economist

c.Financial analyst

d.Market research analyst

ii.Chemistry is applied in the following processes EXCEPT:(1mark)

a.Water treatment

b. Marking school desks

c.Manufacture of paints

d.Marking soap and detergents

iii)What is the risk associated with the misuse of chemistry knowledge? (1mark)

a.Advanced agricultural productivity and food security.

b.Improved environmental protection and human health.

c.Accidental chemical reactions causing harm to individuals or communities

d.Increased development of new technologies with no harmful effects.

iv.Which of the following is a liquid non-metal at room temperature (1mark)

a. Oxygen

b. Nitrogen

c. Carbon

d. Bromine

V.Who is known as the father of the periodic table? (1mark)

a.Dmitri Mendeleev

b.J.W.Dobereiner

c.Henry Moseley

d.J.A.R.Newlands

VI.Which of the following are not crystalline allotropes of carbon? (1mark)

a.Graphite

b.soot

c.Amorphous

d.both b and c

VII. Which type of bond is characterized by a sea of electrons that are free to move around among metal atoms? (1 mark)

a. Metalllic bonb

b. Ionic bond

c. Electrovalent bond

d. Covalent bond

VIII. The number of particles present in 1 mole of any substance is :(1mark)

a. 6.022×10^{20}

b. 6.022×10^{23}

c. 6022×10^{2210}

d. 60.22×10^{22}

Qn 2. Fill in the blanks, in each of the following sentences, with the proved terms:

FILTRATION, MAGNETIC SEPARATION, HOMOGENEOUS MIXTURE, DECANTATION. (4 marks)

a).....is a technique used for separating immiscible mixtures

b) ..... is a composition of two or more substances, whose components distribute uniformly into each other.

c) .....is a technique used for removing the solid particles from the liquid or gaseous fluid.

d) A mixture of flour and iron nails can be separated with.....

Qn3. For each of the following statements, answer True(T) or False(F). (4 marks)

a. Aluminium oxide(Al_2O_3) is a basic oxide

b. Nitrogen dioxide (NO_2) is an acidic oxide.

c. A neutral oxide reacts with both acids or bases

d. A solution of Sulphur dioxide (SO_2) and water turns blue the red litmus paper.

Qn4.Diamod and graphite are the two crystalline forms of carbon.

a) Copy and complete table 1 below with the terms: good, poor, soft and hard. (4marks)

Property	Diamond	Graphite
Electrical conductivity		
Hardness		

b) Both diamond and graphite are insoluble in water because, (1 mark)

i)There are many attractions which occur between water molecules and carbon atoms

ii) There are strong attractions which occur between water molecules and carbon atoms

iii)There are no possible attractions which occur between water molecules and carbon atoms.

Qn4.State whether each of the following statements about the properties of elements in the periodic table is TRUE(T) or FALSE(F) .

i)Both sodium (Na) and Sulphur(S) are in the same period3.Na is a good conductor of electricity while Sulphur is a bad conductor.....(1 mark)

ii) Carbon in the form of graphite is a bad conductor of electricity .....(1 mark)

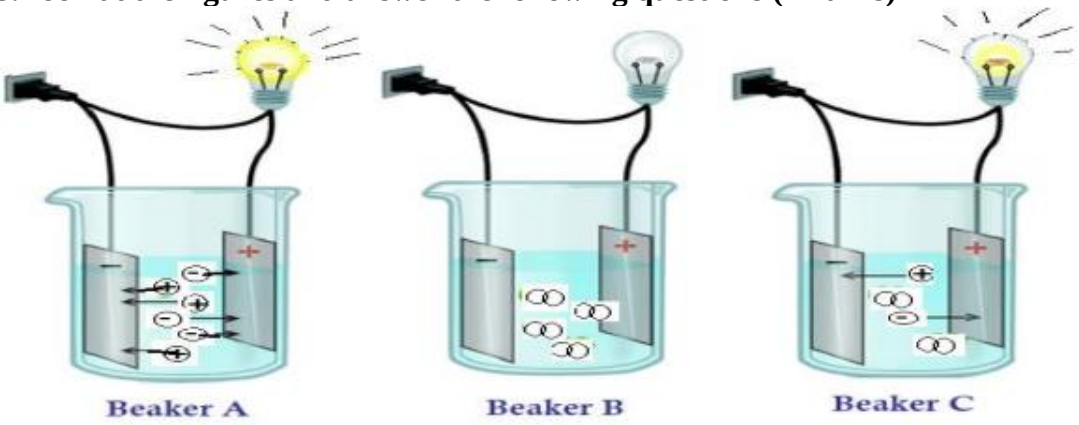
iii)Both magnesium (Mg) and chlorine (Cl) are in the same period3.

The melting point of Mg is lower than that of Cl.....(1mark)

iv) Zinc metal reacts with dilute sulphuric acid to give zinc sulphate solution and hydrogen gas.....(1mark)

(Atomic numbers=11,Mg=12,S=16,Cl=17)

Qn5.Look at the figures and answer the following questions (4marks)



(a) Which of the beakers contains non –electrolyte?

(i) Beaker A **(iii)Beaker C**
(ii) Beaker B **(iv)All of these**

(b) Which of the beakers contains weak electrolyte?

i. Beaker A **iii. Beaker C**
ii. Beaker B **iv. all of these**

(c) Which of the beakers contains strong electrolytes?

(i) Beaker A **(iii)Beaker C**
(ii) Beaker B **(iv)All of these**

(d) The beaker B may contain:

i. glycose **iii. sulphuric acid**
ii. sodium chloride solution **iv. none of these**

Qn6.Air is a mixture of gases.

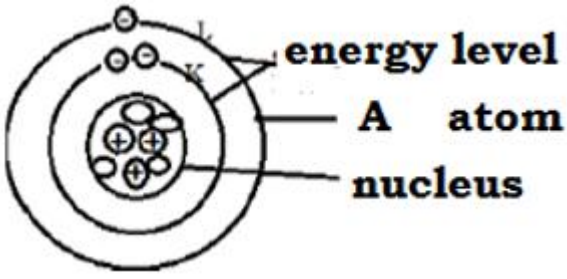
(a) **Name a gas which is the most active part of air? (1mark)**

…….

(b) **Nitrogen constitutes about 78% of air. What is the importance of its high percentage in air? (1mark)**

…….

(c) Following diagram represents the general structure of atom of element



A

i. state the number of protons in A (1mark)

…….

ii. State the number of electrons in A (1mark)

…….

iii. State the number of neutrons in A (1mark)

……...

Qn7.Match column A and column B correctly (3 marks)

column A	column B
(a) 	(i) Toxic
(b) 	(ii) Flammable
(c) 	(iii)corrosive

Qn8.Fill in the blanks of the following equations, with the appropriate compound.

i) $Na_20(s) + H_20(l) \longleftrightarrow$ .....(1mark)

ii) $Mg(s) + H_2SO_{4(aq)} \rightarrow MgSO_{4(aq} +$ .....(1 mark)

iii) $NaCl(s) + H_2SO_4(l) \longrightarrow NaHSO_4(aq) +$ .....(1 mark)

iv) $CaCO_3(s) + 2HCl(aq) \longrightarrow$ .....+ $CO_2(g)$+ $H_2O(l)$ (1 mark)

Qn9.choose a correct answer for each of the following questions.

a) Which type of reaction is represented by the equation (1 mark)

.$2KClO_3(S) \longrightarrow 2KCl(s) + 3O_2(g)$?

i. Precipitation

ii. Neutralization

iii.Decomposition

iv. Combustion

b) Which type of reaction is represented by the equation (1 mark)

$HCl(aq) + AgNO_3(aq) \longrightarrow HNO_3(aq) + AgCl(s)$?

i.Combination

ii.Precipitation

iii.combustion

iv.Neutralisation

c)A chemical reaction which proceeds with the evolution/release of heat energy is called: (1 mark)

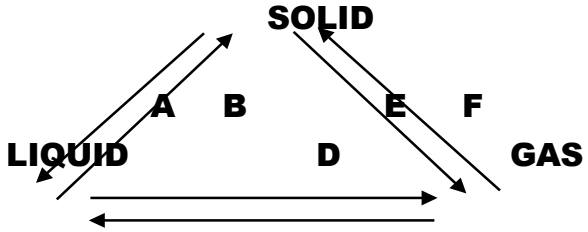
i.combination

ii.endothermic

iii.combustion

iv.Exothermic

Qn10. The diagram below shows the triangle of changes of states of matter.



a.Name the changes of states labelled by letter A,B and F

A…….

B……

F…… (3 marks)

b.State the conditions necessary in order to bring the changes of state C and D. (1 mark)

C……..

D……..

c.Name any one substance that can undergo change of state labelled E. (1 mark)

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Qn11.Element X and Y (not actual chemical symbols) have atomic number 12 and 16 respectively.

a) **To which group of the periodic table do element X and Y belong to? (1 mark)**
b) **Classify the elements as metal and non-metal. (1mark)**
c) **Name type of bond expected when element X and Y react. (1mark)**
d) **Draw dot and cross diagram to show bonding in the compound formed when element X and Y react. (1mark)**

Deduce the formula of the resulting compound(1 mark)

ANSWER FOR Qn

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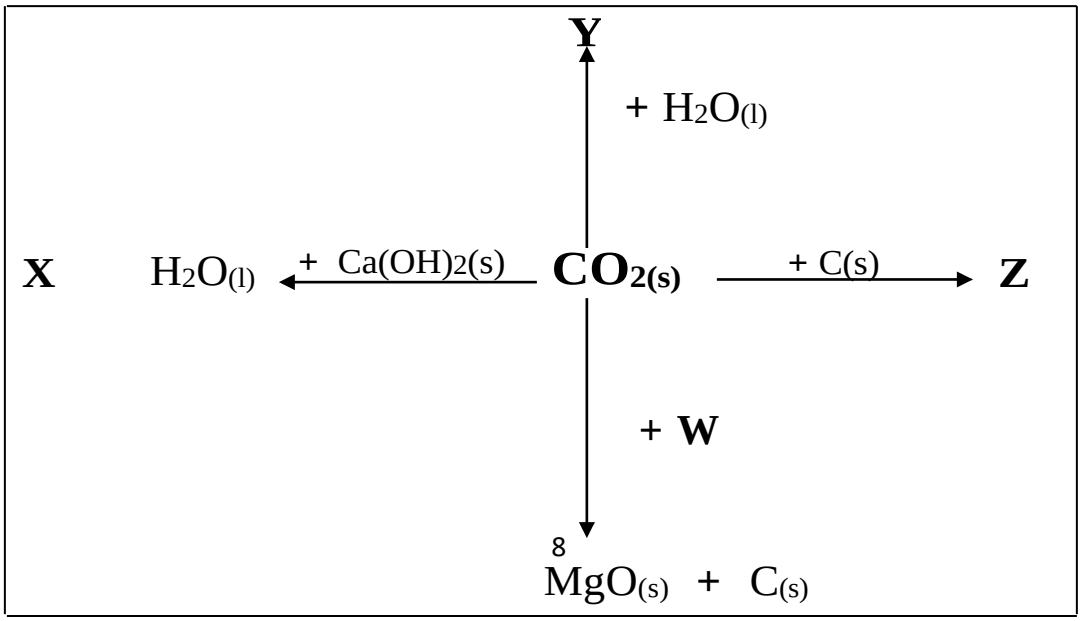
Section B: Four (4) questions, Attempt any 3 Questions of your choice. 30 marks

12.Study attentively the following reactions scheme of carbon dioxide (CO_2). (10 marks)



a) **Identify compounds X, Y, Z and W. (2 marks)**

b) **State three physical properties and explain three uses of carbon dioxide. (3 marks)**

c) **Describe a chemical test for identification of carbon dioxide. (Include the test reagent, observation and equation for the occurring reaction). (3 marks)**

d) **Mention two ways in which carbon dioxide is removed from the atmosphere and two ways in which carbon dioxide is supplied to the atmosphere. (2 marks)**

Qn13. Sulphuric acid is manufactured in the contact process according to the steps shown below:(10 marks)

I: Sulphur is buned in air (oxygen).

II: The product reacts with more air (oxygen) in the presence of a catalyst to form Sulphur dioxide.

III: Sulphur trioxide is absorbed in concentrated acid and then diluted with water.

a) **Give a balanced equation for the reaction in step I. (2 marks)**

b) **Give a balanced equation for the reaction in step II (2 marks).**

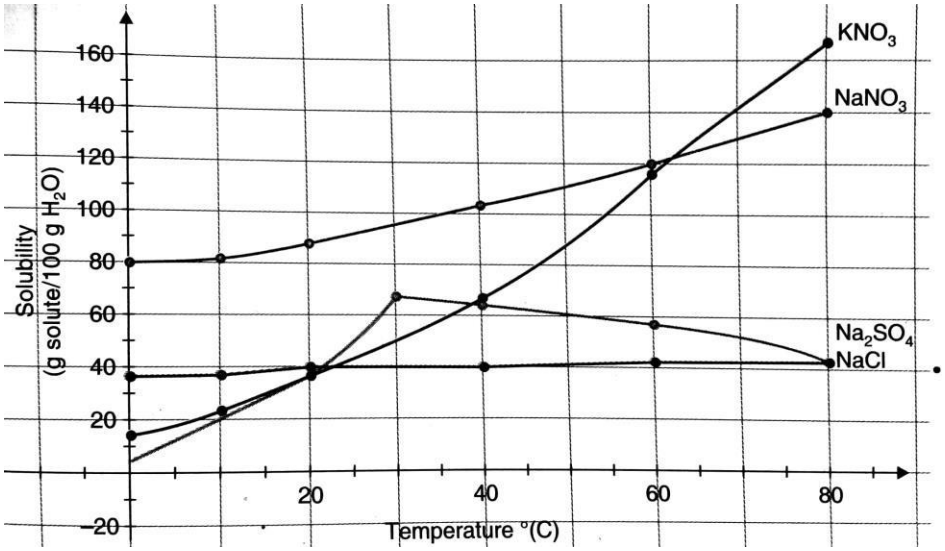
c) **Give formula and name of the catalyst used in step II. (2 marks)**

d) **Briefly, explain why Sulphur trioxide does not directly react with water. (2marks)**

e) **Give two large scale uses of sulphuric acid (2 marks)**

Qn14. a. What are the factors that influence the solubility of salt? (2 marks)

b. Answer the following questions using the solubility graph below:



i) **How much sodium nitrate will dissolve at 30 ^{0}C? (1 mark)**

ii) **Which salt is most soluble at 60 ^{0}C? (1 mark)**

iii) **Which salt is least soluble at 40 ^{0}C? (1 mark)**

iv) **At what temperature will 60 g of sodium sulphate dissolve in 100 g of water. (1 mark)**

b) The solubility of salt at 30 ^{0}C is 40. What amount of water is required to make saturated solution of 80 grams of a solute? (2 marks)

c) At 30 ^{0}C, 14 grams of sugar dissolves in 10 grams of water to form a saturated solution. Find the solubility of sugar (2 marks)

Qn15. During titration, 25 ml of a 0.1 mole/litre Na2CO3 solution was poured in a beaker. An appropriate indicator (3 drops of phenolphthalein) was added to the Na2CO3 alkaline solution. Titration of HCl(aq) from a burette was done. Neutralization of the base was reached in addition of 27.50 ml of HCl(aq).

Equation: $2HCl(aq) + Na_2CO_3(aq) \longrightarrow 2NaCl(aq) + CO_2(g) + 2H_2O(l)$

a) State the name of another acid-base indicator that can be used to detect Na2CO3 solution and the colour of this indicator in the base. (2 marks)

b) Calculate the number of moles of Na2CO3 present in 25ml of solution. (2 marks)

c) Calculate the number of moles of HCl (aq) in 27.50ml of the solution. (2 marks)

d) Calculate the molarity (moles / litre) of HCl(aq). (2 marks)

e) Calculate the mass of anhydrous Na2CO3 that was used to prepare

25ml of the solution. *(Atomic mass: Na = 23, C =12, O =16) (2 marks)*

Answer for question 12,13,14,15.....

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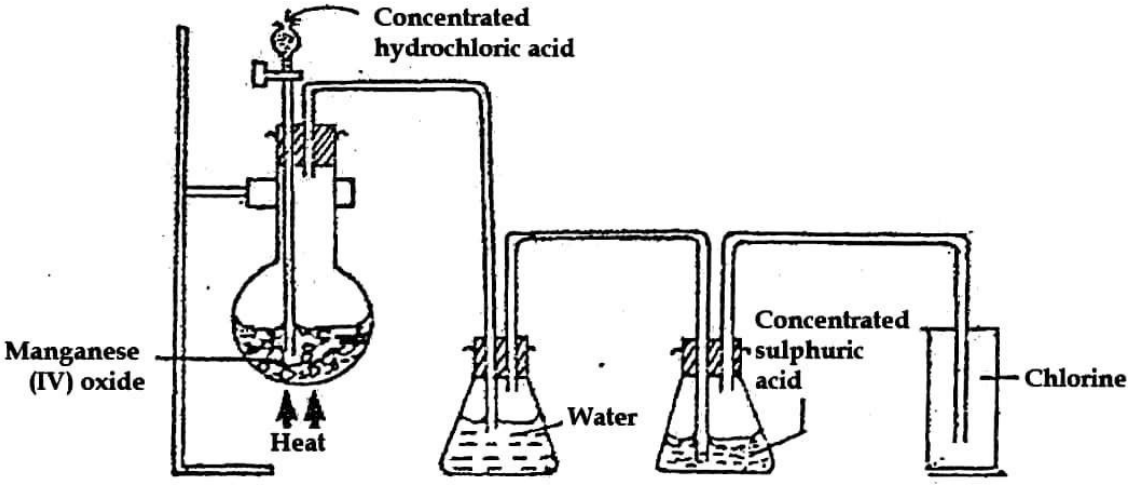
Section C: One (1) Compursory questions. /15 marks

Qn16. **Dry chlorine can be prepared by the reaction between manganite (IV) oxide with concentrated sulphuric acid. Below is a diagram of this preparation:**



a) **Write the chemical equation of the reaction between manganese (IV) oxide and concentrated hydrochloric acid. (4s marks)**

b) **What are the roles of water and concentrated sulphuric acid in this experiment? (2 marks)**

c) **When chlorine reacts with iron:**

iii) **Iron (II) chloride is not formed. (1 mark)**

iv) **State the compound that is instead of iron (II) chloride. (1 mark)**

d) **With the aid of ionic equation, state what would be observed if chlorine was bubbled through the solution of:**

i) **Iron (II) sulphate (2 marks)**

ii) **Potassium iodide (2 marks)**

e) **Chlorine is a bleaching agent when in the presence of cold water. Write an equation for the reaction between chlorine and cold water. (3 marks)**

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HARD WORK REWORD

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