233/1

CHEMISTRY

Paper 1

(THEORY)

June-July 2019

2 hours

SUKELLEMMO JET

CHEMISTRY

Paper 1

(THEORY)

2 hours.

NAME:

……

CLASS:

……

INDEX NO:

……

ADM NO:

……

SCHOOL:

…….

DATE: ……SIGN……

Instructions to Candidates:

*a)Write your **name and index** number in the spaces provided above.*

*b)***Sign and write** *the date of examination in the spaces provided above.*

*c)Answer **ALL** the questions in the spaces provided in the question paper.*

d)Mathematical tables and silent electronic calculators may be used.

e)All working MUST be clearly shown where necessary.

f)Candidates should check the question paper to ascertain that all pages are printed as indicated and that no questions are missing.

For Examiner's Use Only:

QUESTIONS	*Max. score*	*Candidates score*
1-27	*80*	

This paper consists of 16 printed pages

1)***Manganese (IV)oxide*** is one of the compound used in ***the preparation of oxygen gas*** .

a)Write down the ***chemical formula of Manganese(IV) oxide.***

……(1mk)

b)***Give one*** use of ***Manganese (IV) oxide*** in the preparation of ***oxygen gas*** (1mark)

……(1mk)

2a)Name ***two types of flames*** produced ***by a Bunsen burner***

……

……(2marks)

b)Describe ***how luminosity*** of a flame ***can be increased***

……

……(1mk)

3a)***Define*** the following terms;

i)***Lattice energy***

……

……(1mk)

ii)***Hydration energy***

……

……(1mk)

b)Given the following , ***find the lattice energy*** of potassium bromide

$KBr_{(s)} + aq \longrightarrow K^+_{(aq)} + Br^-_{(aq)} \quad \triangle H = +8$ kJ/mole

$K^+_{(g)} + Br^-_{(g)} \longrightarrow K^+_{(aq)} + Br^-_{(aq)} \quad \triangle H = -655$ kJ/mole

……

……

……

……(1mk)

4a)***State*** Boyle's law

……

……

……(1mk)

b)A gas ***occupies 650cm^3*** at a pressure of ***760mmHg*** .If the pressure is raised to ***1220mmHg***,what volume would the gas occupy?

……

……

……(2mks)

5a)The following ***numbers represents P^H values*** of some substances,

2,4,5,7,9 and 13.

Select the ***appropriate P^H*** for each of the following

i)***Sour milk***

……(1mk)

ii)***Wood ash*** solution

……(1mk)

b)***A gas Q is prepared by adding concentrated Sulphuric (VI) acid*** to Sodium chloride crystals .

Q is denser than air and dissolves in water to form a solution ***of P^H less than 3.***

Name gas Q

……

……(1mk)

c)Which ***property of concentrated Sulphuric (VI) acid*** is applied in the ***preparation for gas Q.***

……

……(1mk)

6)***30.0cm^3 of sodium hydroxide*** solution was diluted ***to 810cm^3***. ***27.0cm^3*** of the diluted solution required ***25.0cm^3 of 0.054M*** sulphuric (VI) acid for complete neutralization. Determine the mass of sodium hydroxide in **30.0cm^3** of solution***.(Na=23,O=16,H=1.0)***

……

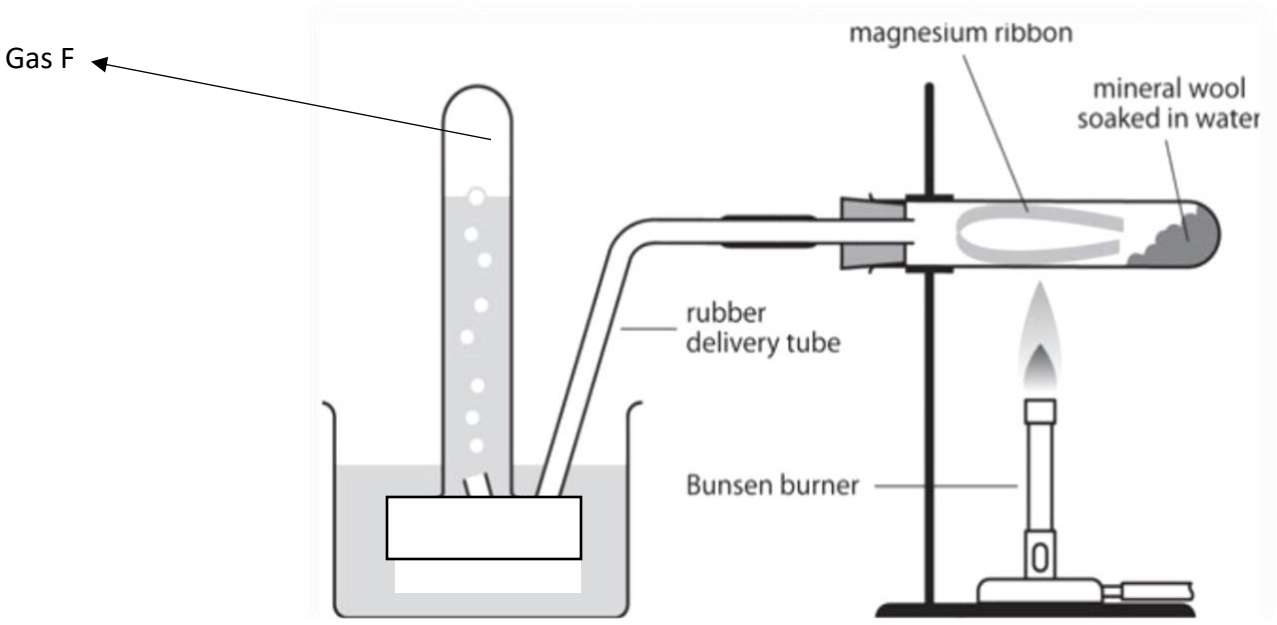
……

……

……(3marks)

7)A student used the set up shown in the diagram below ***in order to study the reactions of some metals with steam.***

The experiment was carried ***out for ten minutes***.



a)What ***observation would*** be made ***if gas F is ignited*** ?

……

……(1mk)

b)When the experiment was repeated ***using iron powder*** instead of magnesium ribbon ,***very little gas F was obtained.***

i)Give ***a reason*** for this ***observation.***

……

……(1mk)

ii)What ***change in conditions of the experiment*** should the student have made in order to increase the volume of gas F produced.

……

……(1mk)

8)Element Y is made up of three isotopes ; ^{20}Y,^{21}Y ***and*** ^{22}Y with percentage abundance of

(x +82.1)% , 0.26% and x% respectively.

The relative atomic mass of element ***Y is 20.179***.

Calculate the percentage abundance of isotope ^{22}Y

……

……

……

……

……(3marks)

9)***State and explain*** the differences in melting point of;

i)Sodium and Aluminium

……

……

……($1\frac{1}{2}$marks)

ii) Oxygen and Sulphur

……

……

……($1\frac{1}{2}$marks)

10)***Using dots(.) and cross(x) diagram***; show the compound formed when ***Aluminum chloride is in vapour form.***

……

……

……

……

……(3marks)

11)***Copper(II) sulphate*** solution forms a ***pale blue precipitate*** when ***reacted with aqueous ammonia .***The ***precipitate dissolves in excess ammonia*** to form ***a deep blue solution***.

a)***Identify*** the pale blue precipitate

……(1mk)

b)Write ***an ionic equation*** for the formation of the ***deep blue solution***

……(1mk)

12)A mixture contains ***Ammonium chloride, Copper (II) oxide and Sodium chloride.***

Describe ***how each of the substances*** can be obtained ***from the mixture.***

……

……

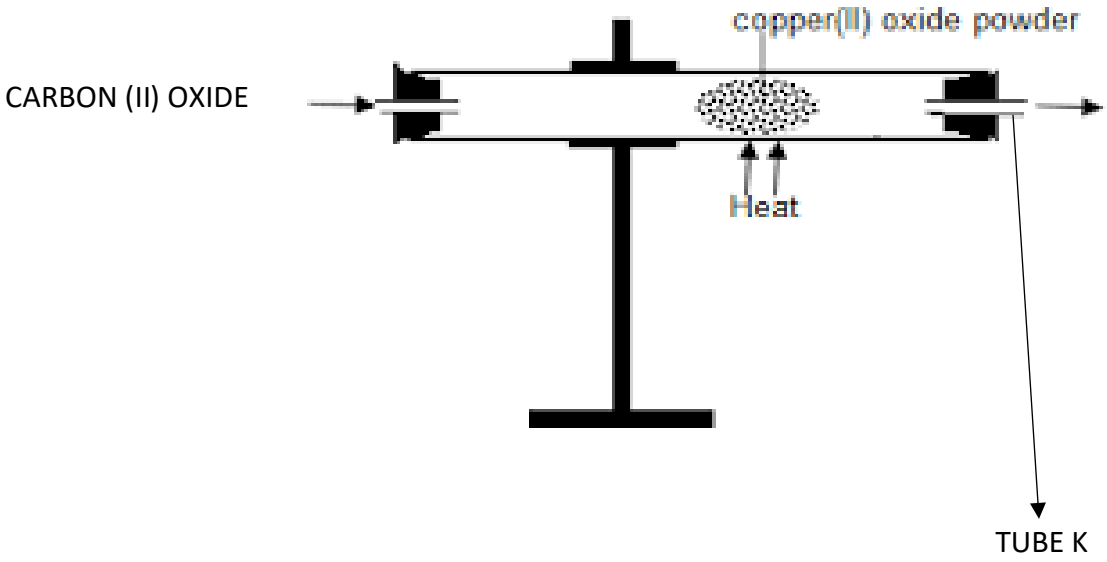
……

……

……

……(3marks)

13)The following apparatus shown below was used to investigate ***the effect of Carbon(II)oxide on Copper(II)oxide.***



a)State the observation that was ***made in the combustion tube*** at the end of the experiment.

……

……(1mk)

b)***Write an equation*** for the reaction that took place ***in the combustion tube***.

……

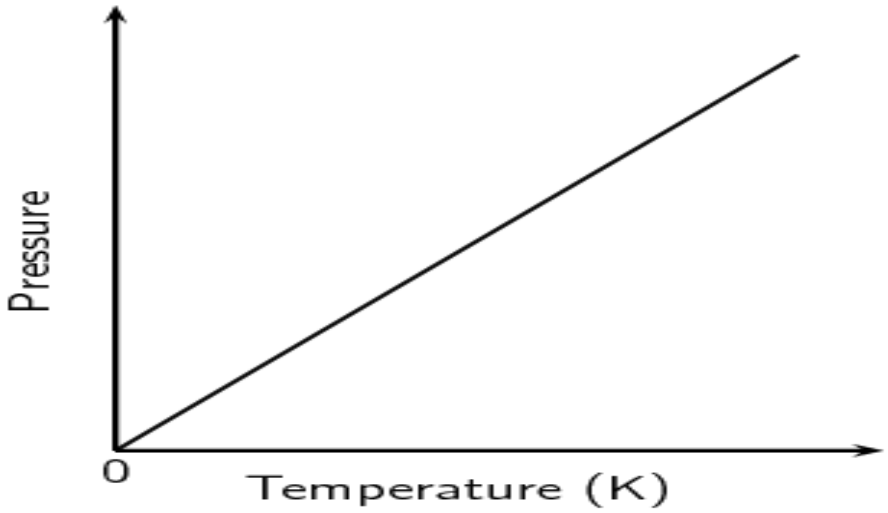
……(1mk)

c)Why is it ***necessary to burn the gas*** coming out of the ***tube K?***

……

…… (1mk)

14)The graph below shows ***the relationship between pressure and the temperature*** of a gas in a fixed volume of a container.



a)State the relationship ***between temperature and pressure*** that can be deduced from the graph.

……

……(1mk)

b)***Using kinetic theory, explain the relationship shown*** on the graph.

……

……

……

……

……(2mks)

15a) ***A pellet of Sodium hydroxide*** left exposed ***to air*** underwent the following changes:

i)Changed into ***a colourless liquid***, then

ii)***Formed colourless transparent crystals*** and finally

iii)The crystals formed ***a white powder***.

a)Use ***one word*** to describe each of the changes in(i) and (iii)

i)

……(1mk)

ii)

……(1mk)

16a)Name **a reagen**t that can use to ***distinguish between $Al^{3+}_{(aq)}$ and $Zn^{2+}_{(aq)}$ ions***.

……(1mk)

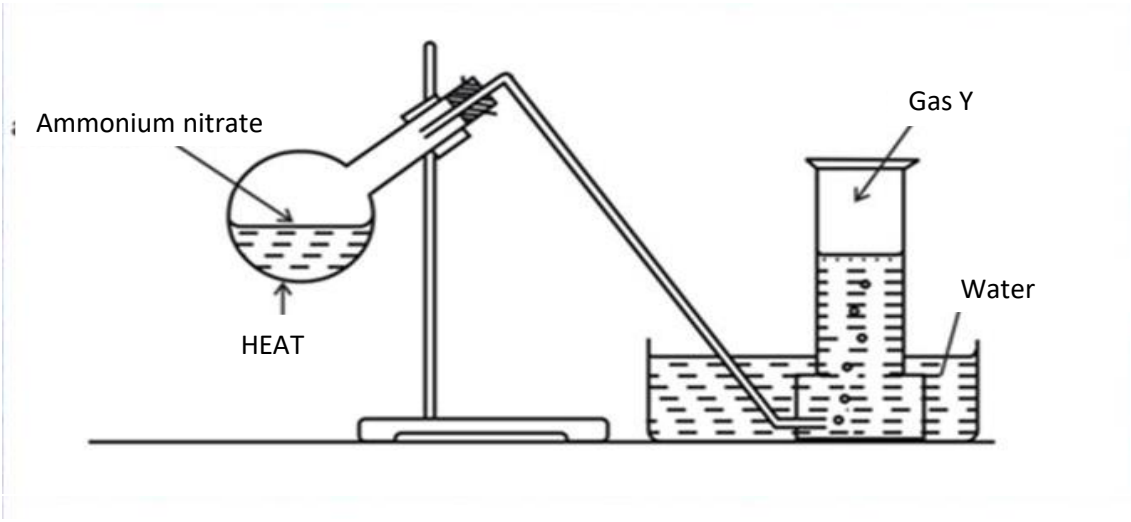
b)***State what is observed*** if each ion is treated separately ***with the reagent*** .

……

……..

……(2marks)

17)The set up shown below was used ***to prepare gas Y.*** Study it and then ***answer the questions that follow***



a)Give the chemical formula ***of gas Y***

……(1mk)

b)Give ***the confirmatory test*** for gas Y

……(1mk)

c)State one ***use of gas Y***

……(1mk)

18a)Write an equation for the reaction between ***hot concentrated Sodium hydroxide and Chlorine gas.***

……(1mk)

b) Chlorine gas bleaches ***by oxidation*** while Sulphur(IV)oxide ***by reduction***. Give any other difference between the two gasses when it comes to bleaching action.

……

……(1mk)

c)Massive ***emission of Chlorine*** gas into the environment is a ***major concern*** to most countries. Give a reason for this.

……

……(1mk)

19)***Draw and name*** all possible isomers **of C_4H_{10}**

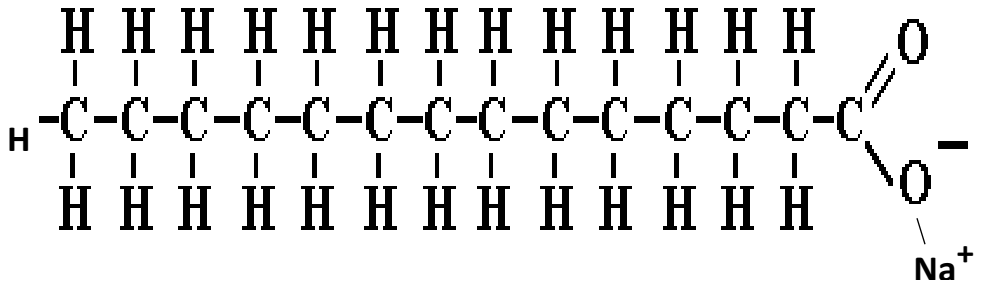
……

……

……

……(3marks)

20)The ***structure of a detergent*** is,



a)Write the ***molecular formula*** of the detergent

……(1mk)

b)What ***type of detergent*** is represented by the formula?

……(1mk)

c)When this type of detergent is used to wash ***linen in hard water***, spots(marks) are left on the linen.Write ***the formula*** of the ***substance responsible for the spots***.

……

……(1mk)

21)***Aqueous lead (II)nitrate react*** with ***aqueous Sodium chloride*** in a closed system forming a white precipitate of lead (II) chloride as shown by the equation below.

$$Pb^{2+}_{(aq)} + 2Cl^{-}_{(aq)} \rightleftharpoons PbCl_{2\,(s)} \qquad \triangle = -350\ Kj/mole$$

a)***State and explain*** the observation that would be made when ;

i)More ***Sodium chloride is added*** to the equilibrium mixture.

……

……(1mk)

ii)***The temperature*** of the equilibrium mixture **is raised.**

……

……(1mk)

iii) Sketch an energy level diagram for the above reaction.

……

……

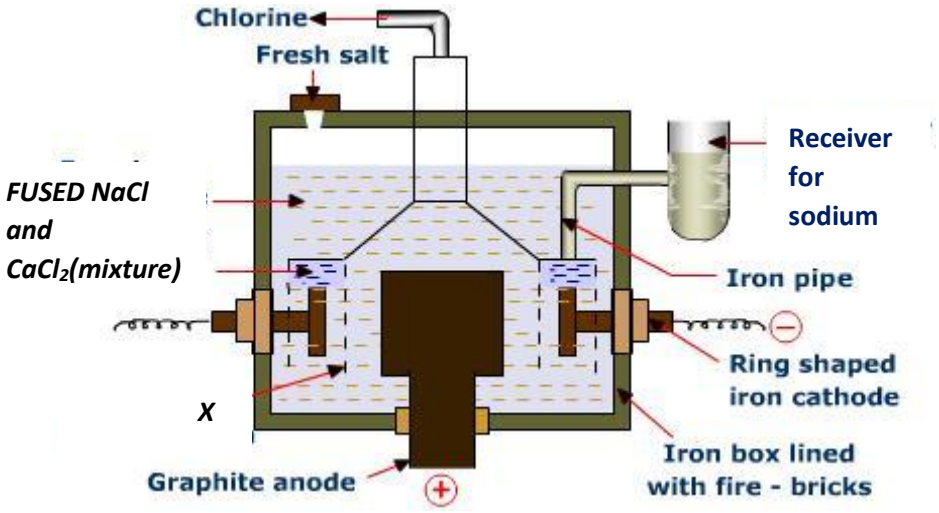
……

……

……

……(2marks)

22)Study ***the diagram below*** and then answer the ***questions that follow***.



a)Write ***down an ionic*** equation for the reaction taking place at the;

i)Anode

……(1mk)

ii)Cathode

……(1mk)

b)What is ***the importance*** of the part ***labelled X*** in the diagram.

……

……(1mk)

c)***Name one property*** that enables us to ***separate Sodium from sodium/calcium mixture***.

……

……(1mk)

23)The equation given below ***represents a redox reaction*.**

$$Mg_{(s)} + 2\,HCl_{(aq)} \longrightarrow MgCl_{2(aq)} + H_{2(g)}$$

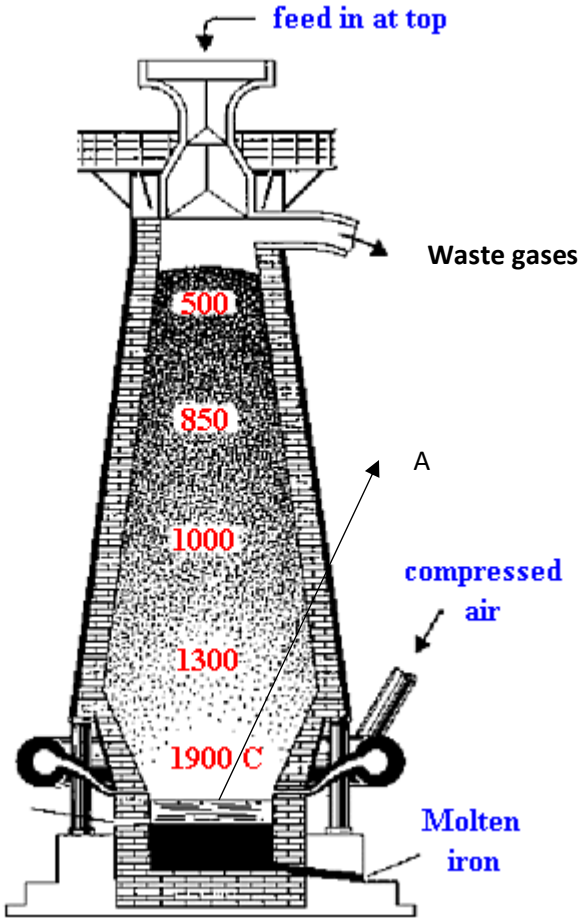
a)Write the equation for the ***reduction process***

……(1mk)

b)Which substance is ***the reducing agent***?

……(1mk)

24)The following diagram represents ***the blast furnace*** in which ***extraction of iron*** is carried out .



i)Identify ***one other raw*** material used apart ***from the iron ore***.

……(1mk)

ii)Write the equation that leads to the formation ***of substance A*** in the blast furnace.

……(1mk)

iii)***State one property*** of the iron produced on the blast furnace.

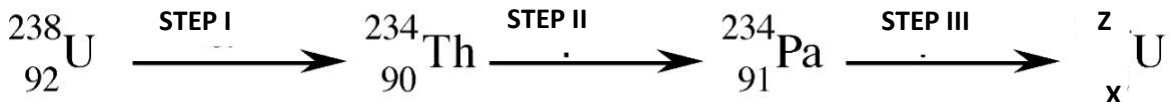
……(1mk)

25a)State ***one way*** in which ***nuclear reactions differ from ordinary chemical*** reactions

……..

……(1mark)

b)The following is a part of ***Uranium decay series***.



i)Which particles are emitted in

Step I

……(1/2mk)

Step II

……(1/2mk)

ii)If a beta particle is emitted ***in step III , find Z and A***

Z

……(1/2mk)

A

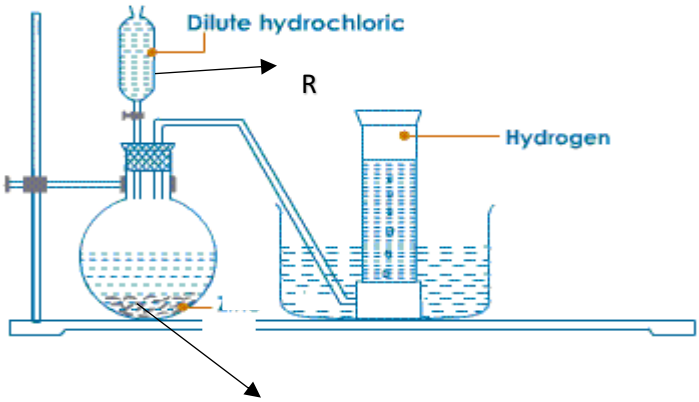
……(1/2mk)

26)Name ***two apparatus*** that can be used to ***measure 25.0cm^3*** of distilled water.

……(1mk)

……(1mk)

27)Below is a set up used to ***prepare and collect hydrogen gas*** in the laboratory. ***Study it and then answer the questions that follow.***



a)Identify ;

i)***Solid Q***

……(1mk)

ii)***Apparatus R***

……(1mk)

b)If the gas was to be ***collected dry, name a suitable drying agent*** that you would use to dry the gas.

……(1mk)

c)Name ***any one industrial use*** of hydrogen gas.

……

……(1mk)

THIS IS THE LAST PRINTED PAGE OF THIS EXAM.