ST. MARY'S SCHOOL –RUNDA

Name……………………………….………….…………

Class……………………………………………………

Adm. No …...…………

Date ……………………

CHEMISTRY FORM III APRIL 2024

HOLIDAY ASSIGNMENT

Instructions to candidates

a) Write your name and admission 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 (**ALL** questions are compulsory)
d) Check the question paper to ascertain that all the pages are printed as indicated and no questions are missing.

FOR EXAMINER'S USE ONLY

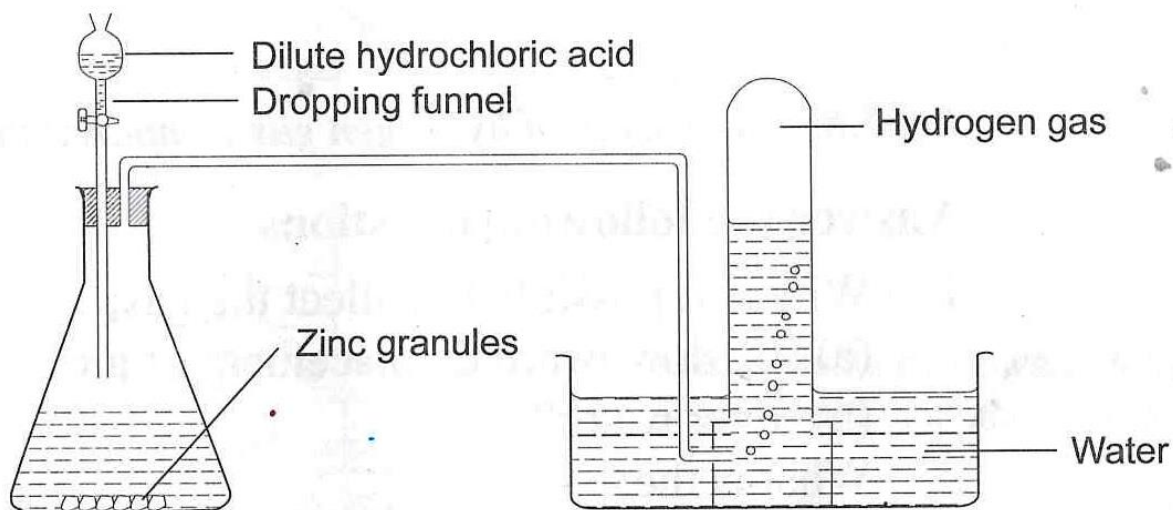| QUESTIONS	MAXIMUM SCORE	STUDENT'S SCORE
1-	100	

1. Distinguish between a dropping funnel and a thistle funnel   (2mks)

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   ………

2. What is a fume chamber/cupboard and give its use

                                                                                          (2mks)

   ………

   ………

3. The setup below was used to prepare and collect hydrogen gas

   (a) write an equation for the reaction that produces hydrogen gas   (2mks)

      ………

      ……..

   (b) Why is hydrogen gas collected over water

                                                                                          (1mk)

      ………

   (c) State what is observed when a few drops of phenolphthalein indicator were added to a

      solution of wood ash.   (1mk)

      …………………………………………………………………………………………………....................

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4. Fractional distillation of liquid air is a method used to separate various gaseous mixture in air. Explain how to (3mks)

i)remove carbon(IV) oxide

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…………………………………………………………………………………………………

ii) remove water

…………………………………………………………………………………………………

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iii) obtain nitrogen

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5. The following apparatus and chemicals are used to investigate the percentage of air used when iron rusts: iron fillings100ml measuring cylinder, trough and water.

a)Draw a setup of the experiment (2mks)

6. What is the method used to obtain sunflower oil from sunflower seeds (1mk)

…………………………………………………………………………………………………

7. After use, non luminous flame should be put off or adjusted to a luminous flame. Explain (2mks)

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8. Draw and show the electron arrangement of phosphorus (atomic number 15)

(2mks)

9. Atoms are made up of subatomic particles.name them

(3mks)

……………………………………………………………………………………………………

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10. In an experiment hydrogen gas was passed over heated copper(II)Oxide as shown.
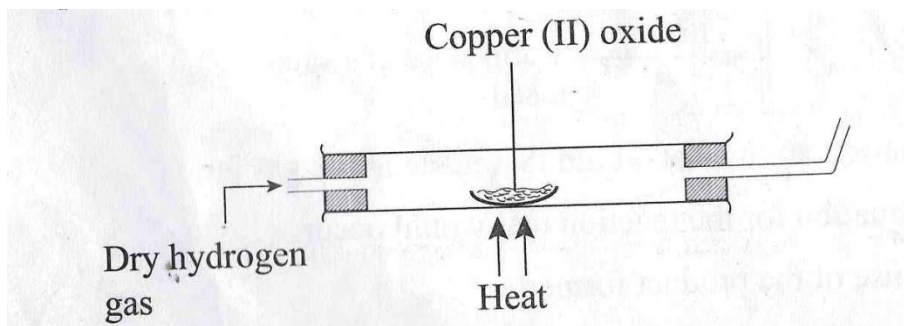
i. State the observations made in the combustion tube after the experiment

(2mks)

……………………………………………………………………………………………………

ii. Write the equation for the reaction between copper(II)oxide and hydrogen gas

(1mk)

……………………………………………………………………………………………………...

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iii.   Explain why heat is necessary in this experiment.

(1mk)

…………………………………………………………………………………………

11. The curves below represent the variation in temperature with time when pure and impure samples of a solid were heated separately.
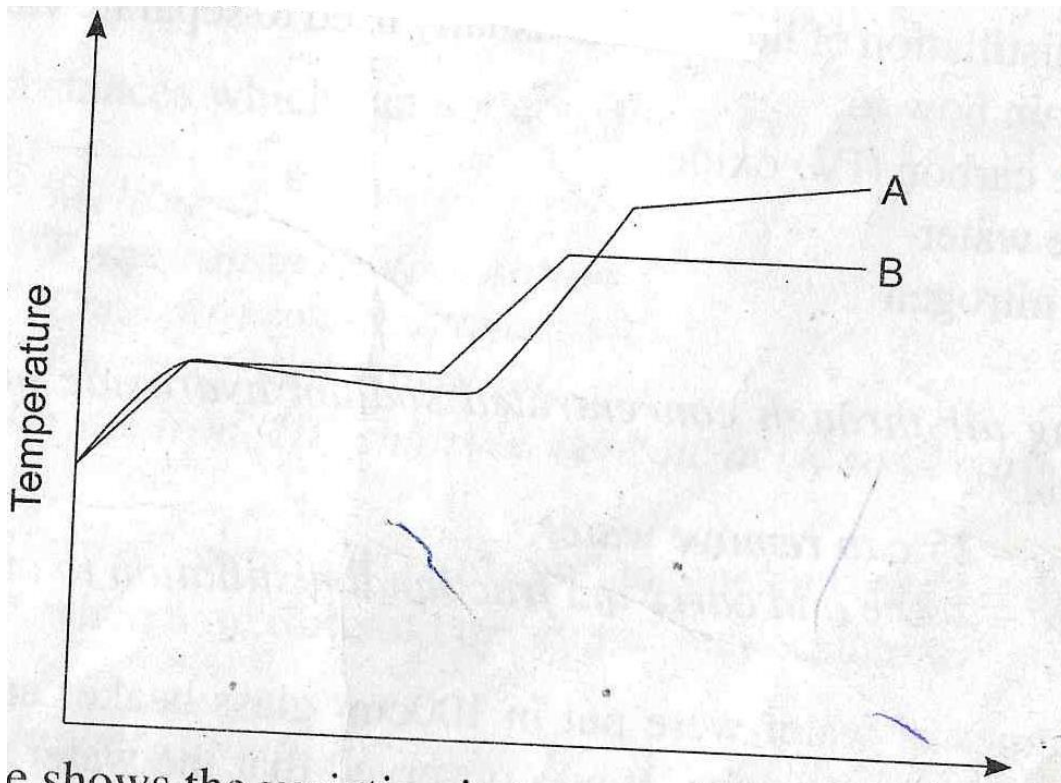
i.   Which curve shows variation in temperature of a pure solid. Explain

(2mks)

……………………………………………………………………………………

……………………………………………………………………………………

ii.   state the effect of an impurity on the melting and boiling points of a pure substance   (2mks)

……………………………………………………………………………………

……………………………………………………………………………………

12. The table below gives the atomic number of elements M,N,P,Q,R,S and T.The letters are not the actual symbols of the elements.

Element	M	N	P	Q	R	S	T
Atomic no.	12	13	14	15	16	17	18

a)

    i.   Write the electron arrangement of element P

(1mk)

……………………………………………………………………………………

……………………………………………………………………………………

    ii.   The stable ion of N (2mk)

…………………………………………………………………………………….

b) Write the formula of the compound formed between N and S

(2mks)

……………………………………………………………………………………

c) Using dot (.) and cross (x) diagram show how bonding occurs between P and S

(2mks)

d) Using dot (.) and cross (x) diagram show how bonding occurs in water molecule.H_2O (2mks)

13. Explain the following observations

    i.   Noble gases are generally unreactive   (1mks)

…………………………………………………………………………………

    ii.   Atomic radius of alkali metals increase down the group   (1mk)

…………………………………………………………………………………

    iii.   Aluminium is a better conductor of electricity than sodium

                                                                                  (1mk)

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14. An element Q consists of three isotopes with mass number of 22,24 and 25 with percentage abundance of 89.6%,6.4% and 4% respectively.Find the relative atomic mass of element Q.   (2mks)

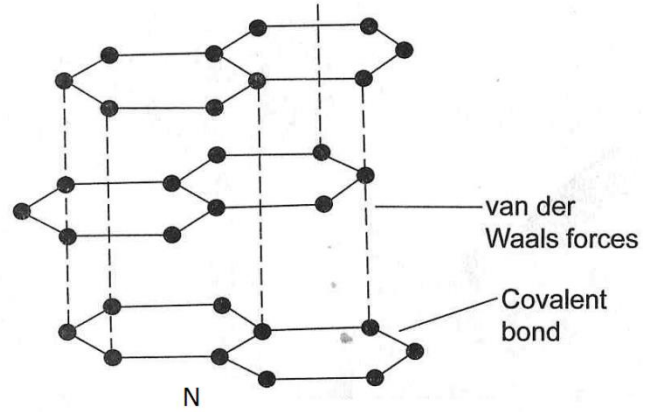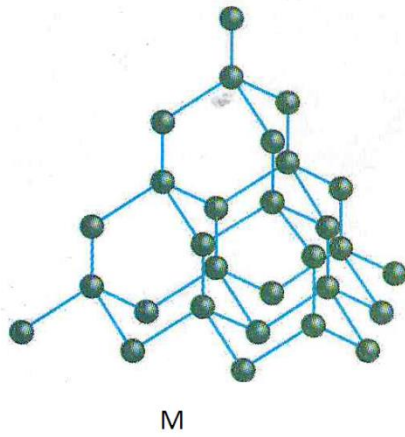15. Write the formula of the compounds below.

                                                        (3mks)

NAME	FORMULAR OF COMPOUND
COPPER(I) OXIDE	
IRON(II)SULPHATE	
SULPHUR(IV)OXIDE	

16. List any 3 elements that belong to group (VIII)of the periodic table

                                                        (3mks)

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17. The following diagrams show the structures of two allotropes of carbon.Study them and answer the questions that follow.
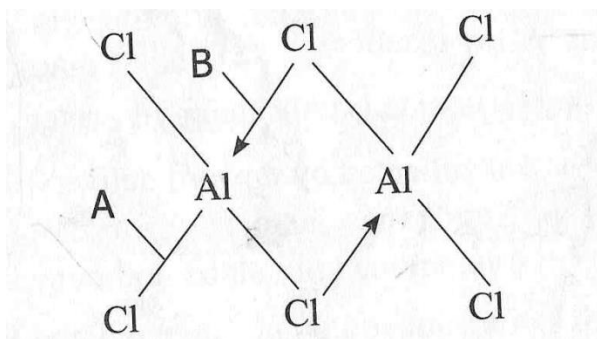

M

N

van der Waals forces

Covalent bond

   i.   Name allotrope   (2mks)

   M-

   N-

   ii.   Give one use of N   (1mk)

……………………………………………………………………………………………

   iii.   Which allotrope conducts electricity? Explain

                                                                     (2mks)

……………………………………………………………………………………………

18. Below is a structure of Aluminium chloride.

   i.   Identify the bonds labelled A and B   (2mks)

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   ii.   Aluminium oxide is said to be an amphoteric oxide,what is an amphoteric oxide

                                                                              (2mks)

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19. study the diagram below and use it to answer the questions that follow.
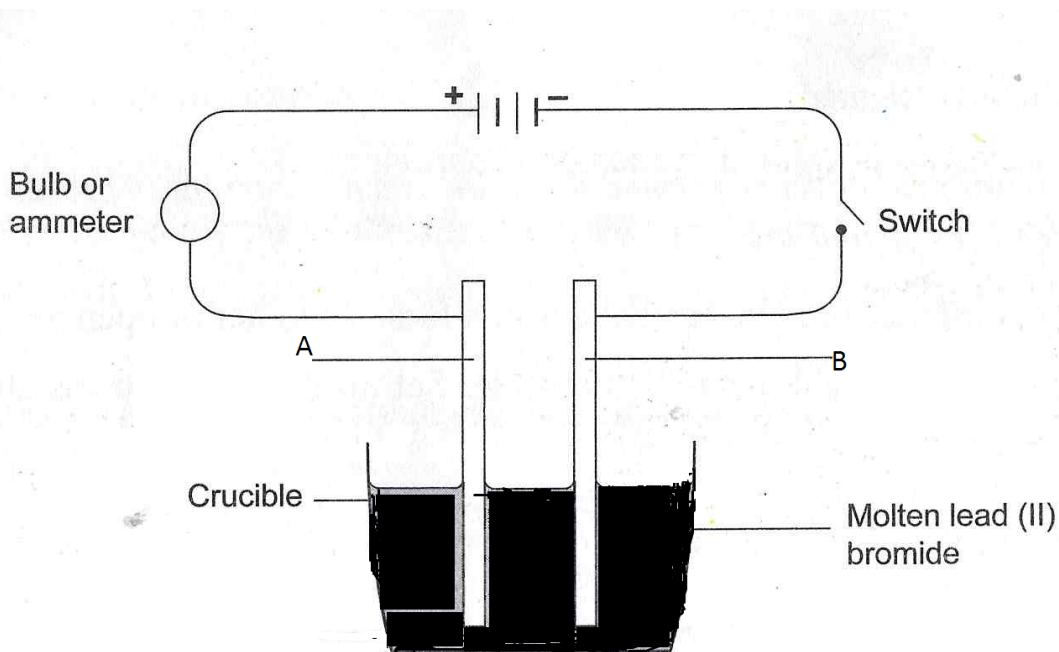
i) Differentiate between electrolyte and non-electrolyte (2mks)

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……………………………………………………………………………………….

ii) Identify electrode A and B

(2mks)

………………………………………………………………………………………

………………………………………………………………………………………

iii) Write the electrode half equation at electrode A

(1mk)

………………………………………………………………………………………

iv) State any two applications of electrolysis

(2mks)

………………………………………………………………………………………

………………………………………………………………………………………

20. Write the chemical equation for the effect of heat on

(2mks)

   i) Lead carbonate- <u>heat</u> →

…………………………………………………………………………………………………

   ii) State two uses of carbon(IV)oxide

(2mks)

…………………………………………………………………………………………………

…………………………………………………………………………………………………..

21. The grid below represents part of the periodic table. The letters do not represent the actual symbols of the elements. Study it and answer the questions that follow:

L						L	
M	P					U	X
					J		
N	Q		R	S		V	Y
			T				
						W	

a) Explain why element **L** appears in two different groups in the grid above (2mk)

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b) State the name of the chemical family to which **P** and **Q** belong (1mk)

……

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c) Write the formula of the compound formed between **P** and **V** (1mk)

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d) Compare the melting points of **Q** and **V**. Explain (2mks)

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e) Write the equation for the burning of **T** in   excess air   (1mk)

………………………………………………………………………………………………………

f)   State **two** use of element **X**   (2mk)

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22. Define the term efflorescence   (2mks)

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23. A fixed mass of gas occupies 200 cm^3 at a temperature of 23^0c and a pressure of 740 mm Hg.Calculate the volume of the gas at -25^0c and 790 mm Hg pressure. (3 marks)

24.(a) State the Graham's law (1 mark)

(b) $100cm^3$ of Carbon (IV) oxide gas diffused through a porous partition in 30seconds. How long would it take $150cm^3$ of Nitrogen (IV) oxide to diffuse through the same partition under the same conditions? (C = 12.0, N = 14.0, O = 16.0) (3 marks)

25. 60 cm³ of oxygen gas diffused through a porous partition in 50 seconds. How long would it take 60 cm³ of sulphur (IV) oxide gas to diffuse through the same partition under the sane conditions?(S = 32.0, O = 16.0) (3marks)

26. A hydrated salt has the following composition by mass. Iron 20.2 %, oxygen 23.0%,sulphur 11.5%, water 45.3%
      i) Determine the formula of the hydrated salt (Fe=56, S=32, O=16, H=11) (3 marks)

      ii) 6.95g of the hydrated salt in **c(i)** above were dissolved in distilled water and the total volume made to 250cm³ of solution. Calculate the concentration of the resulting salt solutionin moles per litre. (Given that the molecular mass of the salt is 278) (4 marks)

27. A sample of unknown compound gas X is shown by analysis to contain Sulphur and Oxygen. Thegas requires 28.3 seconds to diffuse through a small aperture into a vacuum. An identical number of oxygen molecules pass through the same aperture in 20seconds. Determine the molecular massof gas X (O= 16, S= 32)   (3 marks)

28. Gas V takes 10 seconds to diffuse through a distance of one fifth of a meter. Another gas W takes the same time to diffuse through a distance of 10 cm. if the relative molecular mass of gas V is 16.0; calculate the molecular mass of W. (3 marks)

29.(a) State Charles' Law   (1 marks)

b. The volume of a sample of nitrogen gas at a temperature of 291K and 1.0×10^5 Pascalswas $3.5 \times 10^{-2} m^3$. Calculate the temperature at which the volume of the gas would be $2.8 \times 10^{-2} m^3$ at 1.0×10^5 pascals.   (3 marks)