NAME……..…..ADM N O.……

SCHOOL……..…….……DATE……STUDENT'S SIGN……....

233/1

CHEMISTRY PAPER 1

TERM TWO

Time: 2 Hours

FORM THREE

INSTRUCTIONS TO CANDIDATES:

Write your name and Admission number in the spaces provided above

Answer ALL the questions in the spaces provided

Mathematical tables and electronic calculations may be used

All working MUST be clearly shown where necessary

For examiner's use only:

QUESTIONS	Max. score	Candidates score
1		
2		
3		
4		
5		
6		
7		
Total score	80	

TEACHER'S COMMENT ON THE SUBJECT……

1.Identify and state the use of the apparatus shown represented below (2mks)

2.Starting with copper metal, describe how you can prepare solid copper (ii) carbonate.(3 mks)

3.When lead nitrate and sodium sulphate react, a white precipitate is formed.

i)Identify the white precipitate. (1mk)

ii) Write an ionic equation of the reaction. (1mk)

4.When anhydrous calcium chloride is exposed to the atmosphere, it behaves as shown in the equation below.

$$Cacl_{2(s)} \xrightarrow{H_{2o}} Cacl_{2(aq)}$$

i)Name the process that takes place. (1mk)

ii)State one use of the process displayed by anhydrous Calcium chloride. (1mk)

5.a) State Granaly's law of diffusion. (1mk)

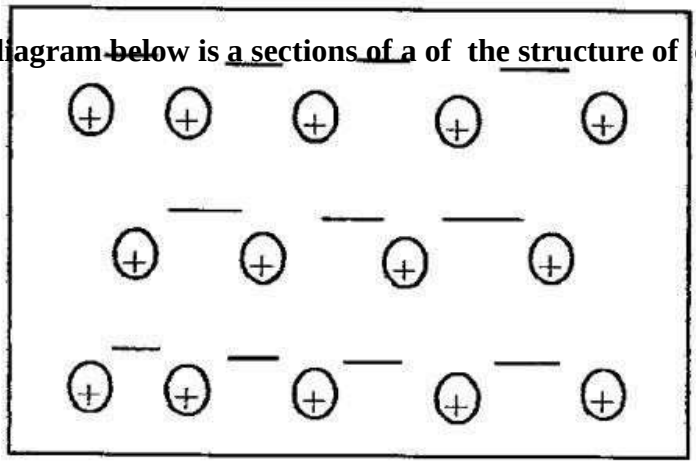
b) A given volume of carbon (ii) oxide diffuses through a hollow pipe in 30secs.Calculate the time taken by the same volume of sulphur (iv) oxide to diffuse through the same hollow pipe under the similar conditions

6.In the reaction below identify the oxidising and the reducing agents .

Oxidising agent _____ (1mk)

Reducing agent (1mk)

7.The diagram below is a sections of a of the structure of element X



Key

⊕ charged nucleus

— An electron

a) State the type of bonding that exists in X (1mk)

b) In which group of the periodic table does element X belong ?give a reason 2mks

8.The ionization energies for three elements A, B and C are shown in the table below.

Element	F	G	H
Ionization Energy KJ/mole	519	418	494

a)What is ment by Ionization energy ? (1mk)

b) Which element is the weakest reducing agent? Give a reason. (1mk)

9. 25.0cm^3 of ethanoic acid (CH_3COOH) was dissolved in water to make 500cm^3 of solution.Calculate the concentration of the solution in Moles per litre. (C = 12.0, 4 = 1.0 , 0 = 16.0, density of ethanoic acid is 1.05g / cm^3) (3mks)

10.An element Y has a relative atomic mass of 6.939 and atomic number 3. It has two isotopes with atomic mass 6.015 and 7.016.

Calculate the relative abundances of the most abundant isotope . 2mks

11.State the functions of the following apparatus in the study of chemistry. (2mks)

a) A Desiccator

b). Pipe-day triangle

12. (a) At room temperature Silicon (iv) oxide is a solid where as Carbon (iv) oxide is a gas although Silicon is next to carbon in group (iv) of the periodic table. Explain. 2mks

b). Give one industrial use of Carbon (iv) oxide. (1mk)

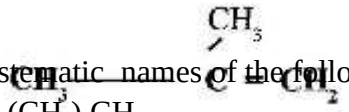
13. (a) What is homologous series ? (1mk)

b) Name all the possible Isomers of an organic compound with a molecular formula C_2H_{12}.(2mks)

14. A mixture contains iron (ii) Chloride, Zinc (ii) oxide and Potassium chloride .Describe how each of the substance can be obtained from the Mixture. (2mks)

15. Give the systematic names of the following hydrocarbons :

(i). $CH_3(CH_2)_4CH_3$ (1mk)

ii)  (1mk)

16. (a) State and explain the observation that would be made when a few drops of concentrated sulphuric Acid are added to a small sample of sugar. (2mks)

b) . Write a chemical equation for the reaction which occurs between wood and hot concentrated sulphuric (vi) acid. (1mk)

17.When lead (ii) nitrate is heated , one of the products is a brown gas .

a) Write an equation for the reaction that occurs (1mk)

b) If 0.58dm^3 of the brown gas was produced ,what was the mass of the lead (ii) nitrate that was heated? (Pb = 207,N = 14, 0 = 16, molar gas volume = 24dm^3) (3mks)

18.The following table shows the PH values of the solutions A, B and C

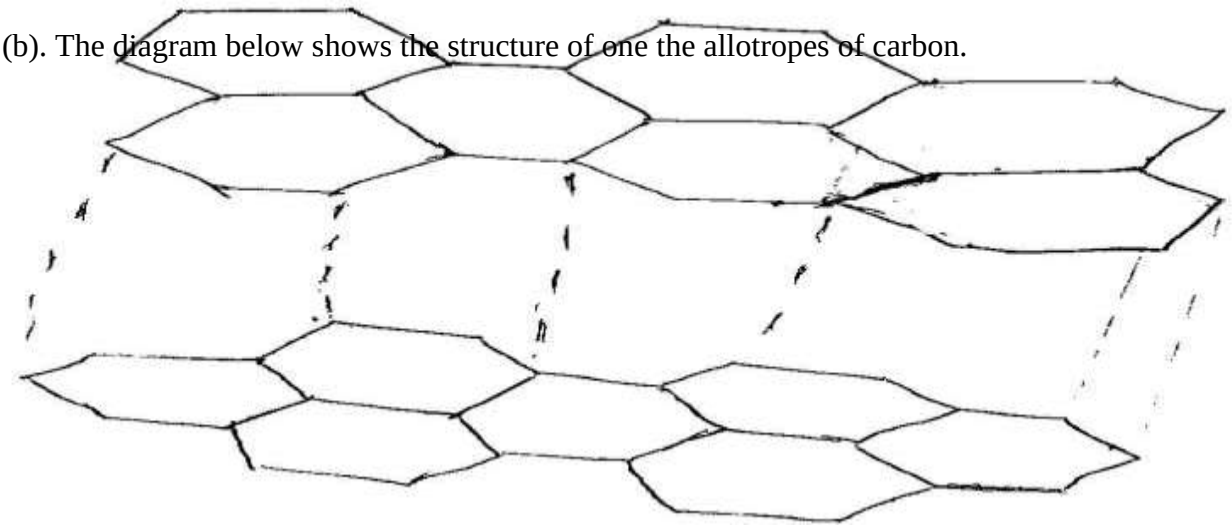
Solution	A	B	C
P^4	2	7	11

i) Which solution is likely to be that of concentrated sodiumchloride. (1mk)

ii) Identify the solution which is likely to be aluminiumChloride .Explain. (2mks)

19.(a) What is meant by allotropy ? (1mk)

(b). The diagram below shows the structure of one the allotropes of carbon.



(i) Identify the allotrope. (1mk)

(ii) State one property of the above allotrope that makes it better lubricant than oil where there is a lot of friction. (1mk)

20. 0.0675 mole of a certain hydrocarbon gas on complete combustion gives 5.94g of carbon (iv) oxide and 2.43g water. Calculate its molecular formular. 3mks

21. A gas occupies 6 litres at 250k and 152 mmHg pressure. At what pressure will its volume be helved ,if the temperature then is 227^{0}c ? 2mks

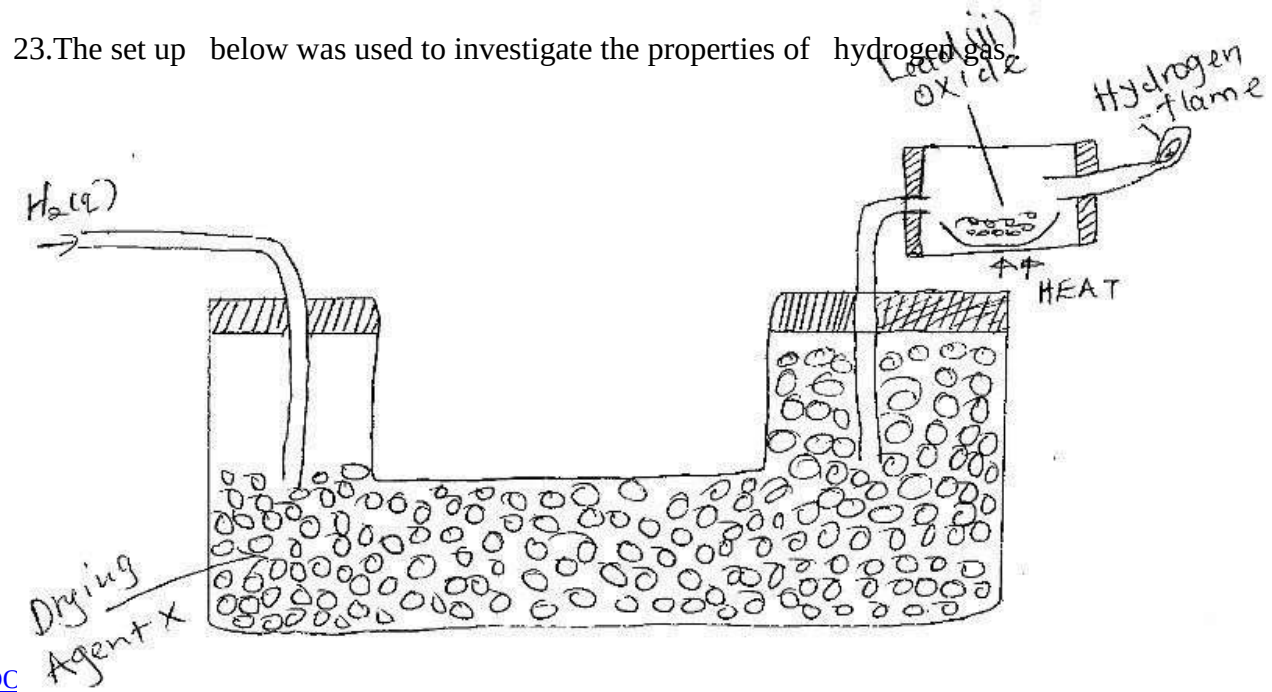
22.The table below shows some properties of three elements in group VII of the periodic table.
Study it and answer the questions that follows .

Element	Atomic No	Melting point(^{0}c)	Boiling point(^{0}c)
Chlorine	17	-101	-34.7
Bromine	35	-7	58.8
Iodine	53	114	184

(a) Which element is a liquid at room temperature ? Give a reason 2mks

b) Explain why the boiling point of the Iodine is much higher than that of chloride. 1mk

23.The set up below was used to investigate the properties of hydrogen gas.



(i)Write equation for the reaction that takes place in the combustion tube and at the flame. 2mks

ii) Suggest a possible drying agent X. 1mk

24.Using dots (.) and crosses (x) to represent electrons ,draw a diagram to represent bonding in water. (4 =1, 0 = 8). 2mks

25. **25**cm^3 of a solution containing 8g per litres of sodium hydroxide was neutralised by 10.0cm^3 of dilute sulphuric acid in moles per litre.

(Na = 23.0, 0 = 46.0, 4 = 1.0) (3mks)

26.Distinguish between the terms detravescent and efforescent as used in chemistry. 2mks)

27.Carbon (iv) oxide can be dissolved in water under pressure to make an acidic solution.

a) What is meant by an acidic solution (1mk)

b)Aqueous lead (ii) nitrate reacted with the acidic solution to for a precipitate.

Write an ionic equation for the reaction. (1mk)

28.Nitrogen and Oxygen are separated from air by fractional distillation .Oxygen boils at 188^{0}c and nitrogen at -196^{0}c.

(a) What state must air be in before fractional distillation can be carried out

(b) Very low temperatures are required for the above process to occur. How are these achieved) 1mk)

(c).Name one other gas that is also obtained from the fractional distillation of air. (1mk)