F2 ENDYEAR ASSIGNMENT

CHEMISTRY

10+ HOLIDAY ASSESMENT PAPERS

Dear Students, Make Maximum Utilization of limited time Available to Attempt and Work on these Year-Round Examination Trials.

A Comprehensive Evaluation Analysis of F1 & F2 Syllabus Coverage.

SERIES 1

For Marking Schemes

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MWALIMU CONSULTANCY

FORM 2 EXAMINATION TRIALS

CHEMISTRY

PRACTICE TEST 1

TIME: 2 HOURS

NAME…….. ADM NO…….....

SIGN……..……. DATE;……...

Answer All the questions in the spaces provided

1. Fractional distillation of liquid air is usually used to separate various gaseous mixtures in air.

Explain how to;

a) Remove carbon (IV) oxide. **(1mk)**

……

……

b) Remove water. **(1mk)**

……

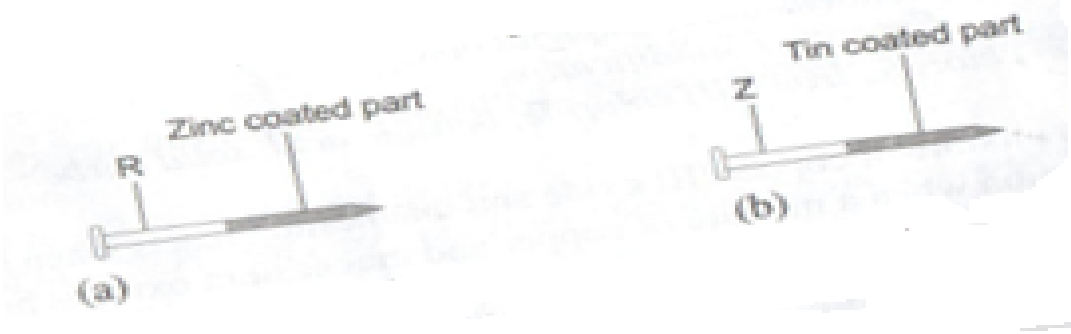
……

c) Obtain nitrogen. **(1mk)**

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2. The diagrams below represent two iron nails with some parts covered tightly with zinc and tin respectively. What observations would be made at the exposed points R and Z if the wrapped nails are left in the open for several days? Explain.

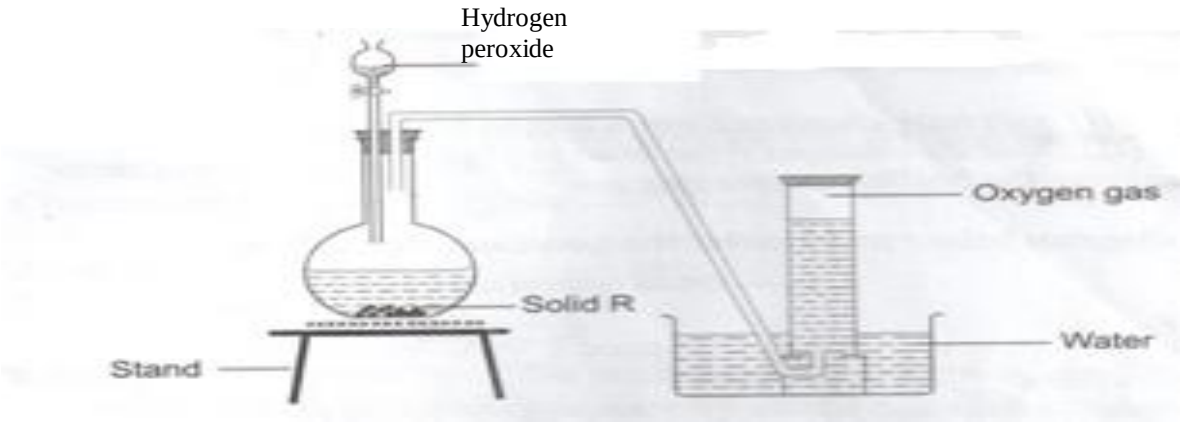


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3. The Diagram below is set-up for the laboratory preparation of oxygen gas.



a) Name solid R

……

b) Write an equation for the reaction that takes place in the flask**.** **(2mks)**

……

……

c) Give one commercial use of oxygen**.** **(1mk)**

……

……

4. An element y has an electron arrangement of 2.8.5

a) State the period and group which the element belongs**.** **(2mks)**

……

……

b) Write the formula of the most stable ion formed when the element Y ionizes **(1mk)**

……

c) Explain the difference between the atomic radius of element Y and its ionic radius **(2mks)**

……

……

5. Lithium has two isotopes with mass numbers 6 and 7. If the R.A.M (relative atomic mass) of Lithium is 6.94, determine the percentage abundance of such isotope.

……

……

6. Other than their location in the atom, name two other differences between an electron and a **proton.** **(2mks)**

……

……

7. Write down the electronic configuration of the atoms with the following atoms with the following atomic numbers **(2mks)**

a) 7

b) 9

c) 14

d) 18

8. An atom of an element has the electronic configuration 2.8.2

a) State its atomic numbers

……

……

b) To which group of the periodic table does it belong? Explain.

……

……

c) Is the element a metal or a non-metal? Explain **(1mk)**

……

……

d) If the atom has 14 neutrons in its nucleus state its mass number. **(1mk)**

……

……

9. Rubidium (Rb) is a member of the alkali metals. Predict how the element reacts with: **(3mks)**

a) Water

……

……

b) Air

……

……

c) Chlorine

……

……

10. Briefly explain the following observations.

1. Noble gases are generally unreactive. **(1mk)**

……

……

2. Alkaline earth metals are generally less reactive than alkali metals in the same period. **(2mks**

……

……

……

FORM 2 EXAMINATION TRIALS

CHEMISTRY

PRACTICE TEST 2

TIME: 2 HOURS

NAME…….. ADM NO…….....

SIGN……..……. DATE;……...

Answer All the questions in the spaces provided

1. (a) What is a Flame **(1mk)**

……

……

(b) In term of colour, size and zones differentiate between luminous and non-luminous flames**(3mk)**

Flames	Colour	Zones	Size
Luminous			
Non-luminous			

(c) Name two apparatus for approximate measure of volume and two apparatus for accurate measure of volume

Approximate measure of volume **(1mk)**

……

Accurate measure of volume **(1mk)**

……

(d) What Is a drug **(1mk)**

……

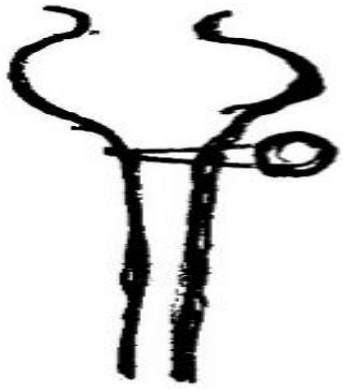
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(e) Give two reasons why most laboratory apparatus are made of glass **(2mks)**

……

……

(f) Name the apparatus below. **(1mk)**



2. (a) What is sublimation **(1mk)**

……

……

(b) Name two substances that undergo sublimation **(1mk)**

……

……

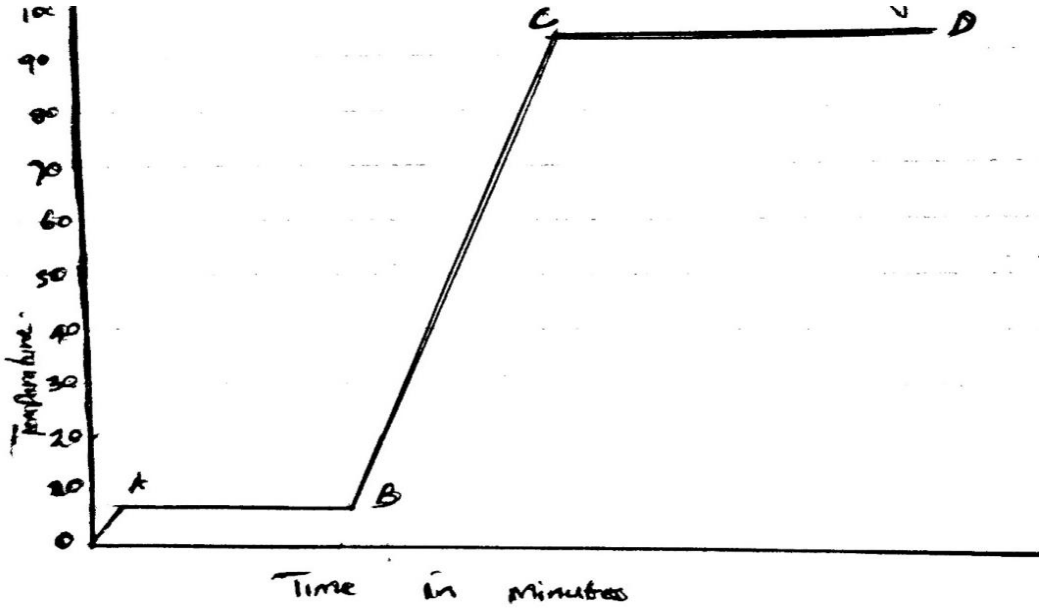
(c) A mixture contains chloride, sand and common salt. Name 3 processes in order that can be used to separate the mixture **(3mks)**

……

……

……

3. (a) The diagram below shows a heating curve of solid A. use it to answer questions that follow.



(a) Is a substance A pure or Impure **(1mk)**

……

……

(b) What is the state of substance A at room temperature? **(1mk)**

……

……

(c) Name the process represented by region AB **(1mk)**

A ……

B ……

(d) The table below shows some chemistry processes. Indicate on the table the type of change that takes place when they occur. **(3mks)**

Process	Type of change
(i) Heating ice	
(ii) Heating hydrated copper (II) sulphate	
(iii) Heating copper (II) Nitrate	

(e) Name the elements in the following compounds

(i) Magnesium Nitrate **(1½mk)**

……

……

……

(ii) Sodium Carbonate **(1½mk)**

……

……

……

4. (a) What is an acid base indicator. **(1mk)**

……

……

(b) The table below show some substances and their PH

Substance	PH
A	7
B	14
C	5
D	10
E	2

Which substance is likely to be;

(i) Sulphuric (VI) acid **(1mk)**

……

(ii) Sodium chloride **(1mk)**

……

(c) Magnesium carbonate reacts with Hydrochloric acid to form a colourless solution T, gas W that forms a white precipitate with lime water and a Liquid S.

(i) Name T,W and S **(3mks)**

T ……..

W ……

S ……..

(ii) Write a word equation to the reaction **(1mk)**

……

……

(iii) Explain why a reaction between Lead Carbonate and Sulphuric (VI) acid stops after a while. **(1mk)**

……

……

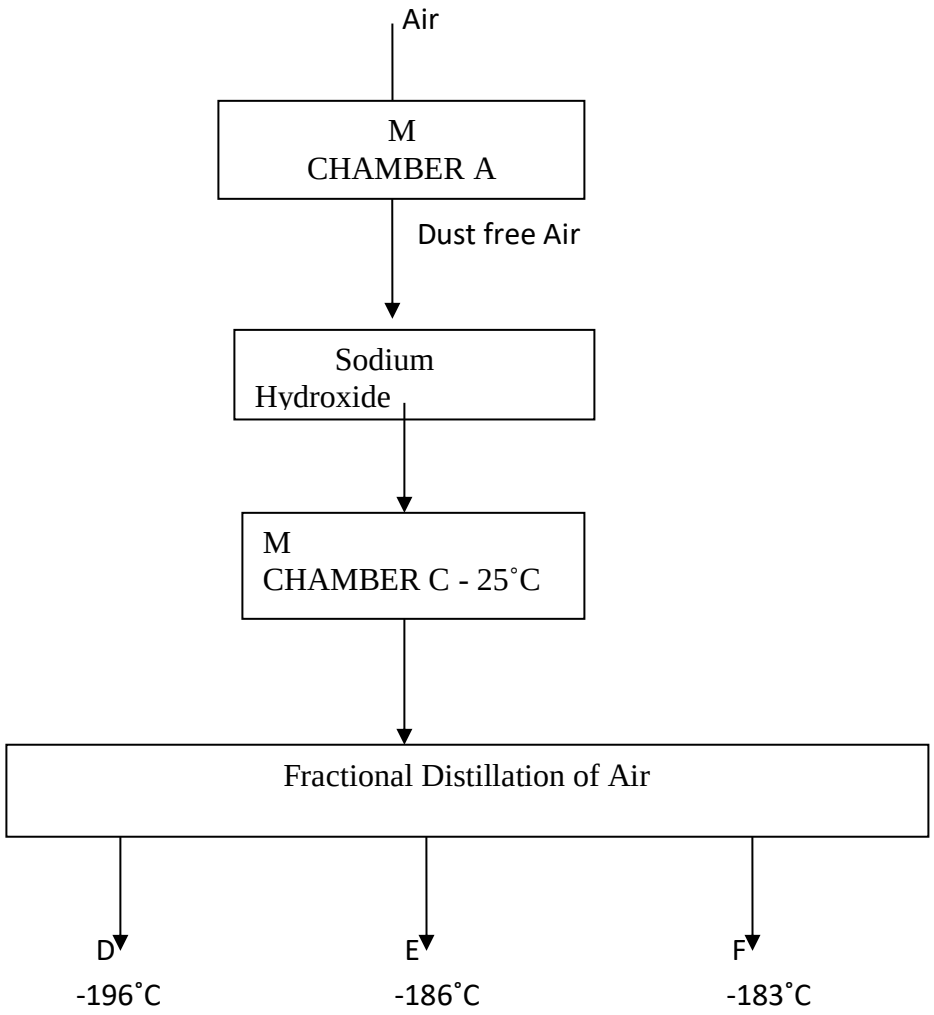
5. Air is a mixture and not a compound, give two reasons

(a) To support this statement **(2mks)**

……

……

(b) The scheme below shows some steps in fractional distillation of Liquid Air. Use it to answer the questions that follows



(i) Name the process that takes place in chamber A **(1mk)**

……

(ii) What is the purpose of sodium hydroxide **(1mk)**

……

(iii) Name the substance…. In chamber C **(1mk)**

……

(iv) Name D, E and F **(3mks)**

……

……

……

6. (i) Write the chemical formula of Rust **(1mk)**

……

……

(ii) State two factors that increases the rate of rusting **(1mk)**

……

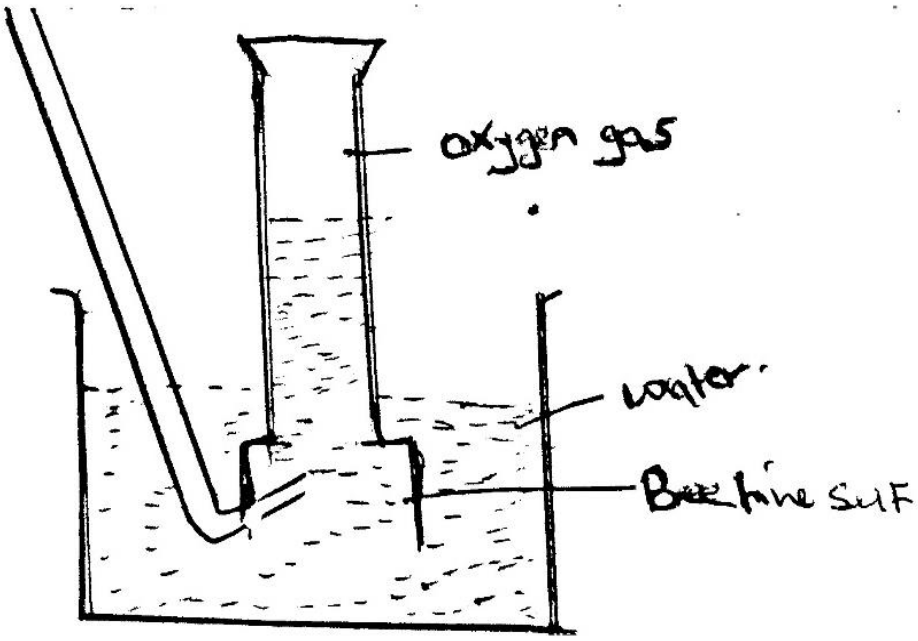
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(iii) State two ways of preventing rust **(1mk)**

……

……

7. In an experiment to prepare oxygen, Manganese (IV) oxide was added to hydrogen peroxide to increase the rate of reaction.



(i) What name is given to a substance like Manganese (IV) oxide **(1mk)**

……

(ii) Oxygen gas is collected using the method shown above.

(a) Name the method **(1mk)**

……

(b) Why is it possible to collect the gas using the method above. **(1mk)**

……

……

(c) How can the gas collected be oxygen? **(1mk)**

……

……

8. The table below show some oxides and their nature. Complete the table **(3mks)**

Oxide	Nature
Sodium oxide	
Aluminium oxide	Amphoteric
	Acidic
Water	

9. (i) What are hydrocarbons **(1mk)**

……

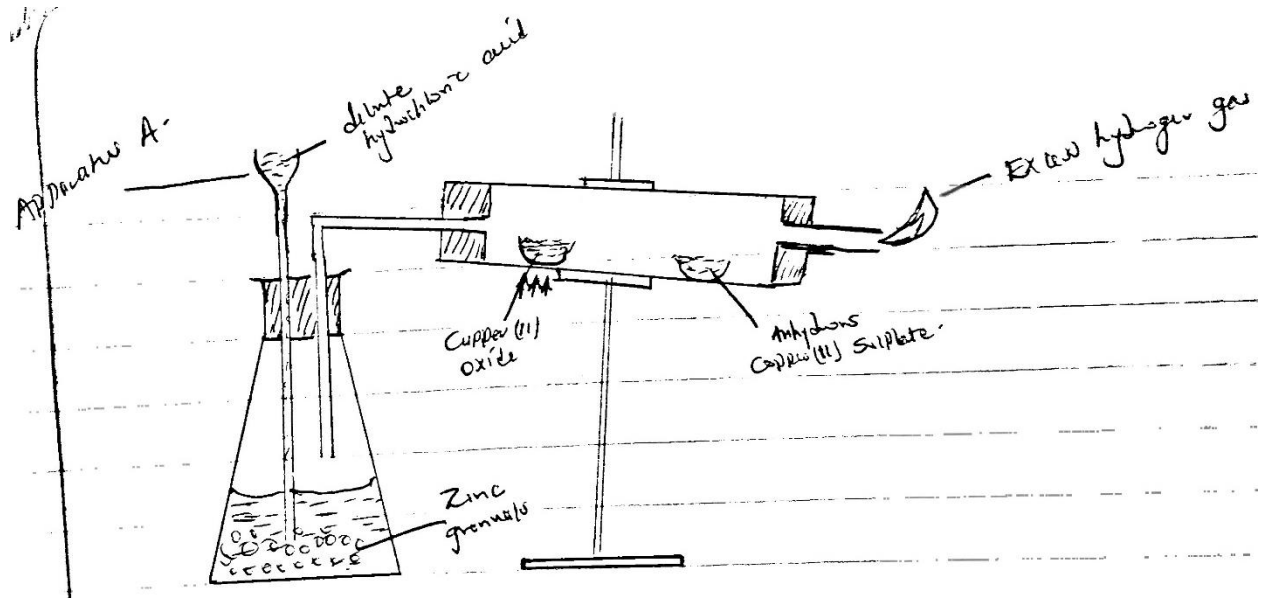
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(ii) Name the two products of burning an hydrocarbon **(2mk)**

……

……

(iii) The diagram below shows some steps and properties of hydrogen gas. Study it and use it answer the questions that follows



(a) Name apparatus A **(1mk)**

……

……

(b) State the observations made in

(i) Copper (II) oxide **(1mk)**

……

……

(ii) Anhydrous copper (II) Sulphate **(1mk)**

……

……

(c) Name the property of hydrogen gas when it reacts with Copper (II) **oxide.** **(1mk)**

……

……

(d) Write a chemical equation for the above reaction **(1mk)**

……

(e) Hydrogen gas is collected by upwards delivery, state one use of hydrogen based on the same property that makes it collected using the above method. **(1mk)**

……

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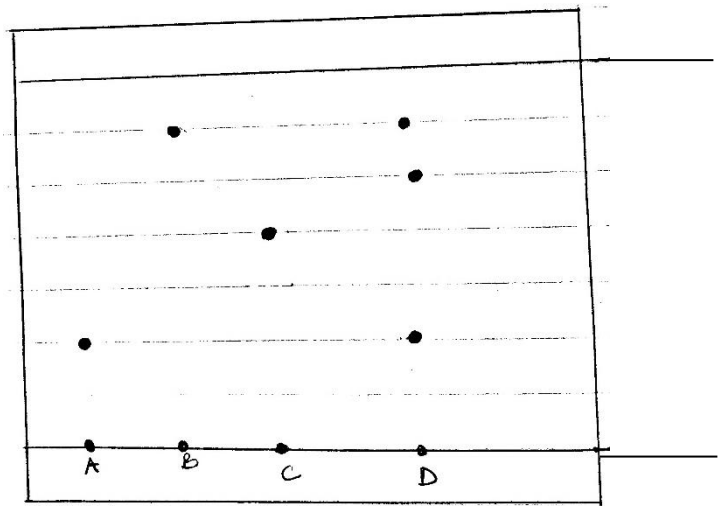
10. Name two physical properties that determines the;

(a) Chromatograph of a substance **(2mk)**

……

……

(b) The diagram below shows the results obtained after chromatography of 3 pure pigments A, B and C together with a mixture D. study it and use it to answer the questions that follows



(i) Which pure pigment is the most soluble **(1mk)**

……

(ii) How many components makes up mixture D **(1mk)**

……

(iii) Name two pure pigments in mixture D **(2mks)**

……

……

11. (a) Other than location state two differences between electrons and protons **(2mks)**

……

……

(b) An element can be represents as $^{39}_{19}Q$

(i) What does 39 represent **(1mk)**

……

(ii) What does 19 represent **(1mk)**

……

(iii) How may Neutron does Q have **(2mks)**

……

(c) Write the formula of Ion of Q **(2mks)**

……

……

12. Write the chemical formula of the following compounds **(5mks)**

(i) Potassium chloride

……

……

(ii) Magnesium chloride

……

……

(iii) Sodium sulphate

……

……

(iv) Copper (II) nitrate

……

……

(v) Aluminium oxide

……

13. The grid below shows part of the periodic table. Letters do not represent the actual symbols of the elements, use it to answer the questions that follows

A								
B								
C	**D**		**E**	**F**	**G**	**H**	**I**	**J**

(a) Give the name of the families to which

(i) A belongs **(1mk)**

……

(ii) I belongs **(1mk)**

……

(b) Write the electronic arrangement of element E **(1mk)**

……

(c) Select an element that forms a divalent cation **(1mk)**

……

(d) Using dots (•) or cross (x) to represent electrons draw the atomic structure of the atom of F.

(2mks)

(e) Select an element that will react rapidly with cold water **(1mk)**

……

……

(f) An element form anion L^+ with the following electron configuration 2:8:8. Indicate the position of L in the arid **(2mks)**

(g) What is the nature of the oxide of C **(1mk)**

……

……

(h) Write the formula of the oxide of E **(1mk)**

……

……

14. (a) What are isotopes **(1mk)**

……

……

(b) Name the two isotopes of carbon **(2mks)**

……

……

(c) Chlorine has two isotopes ^{35}CI and ^{37}CI. If their percentage abundance is 75% and 25% respectively, Calculate the relative atomic mass (R.A.M) of Chloride **(3mks)**

15. Write balanced chemical equation for the reactions outlined below. **(5mks)**

(i) Sodium metal and water

……

……

(ii) Magnesium metal and oxygen

……

……

(iii) Sodium Hydroxide and dilute hydrochloric acid.

……

……

(iv) Zinc metal and dilute Sulphuric (VI) acid

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(v) Calcium carbonate and dilute Nitric (V) acid

……

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FORM 2 EXAMINATION TRIALS

CHEMISTRY

PRACTICE TEST 3

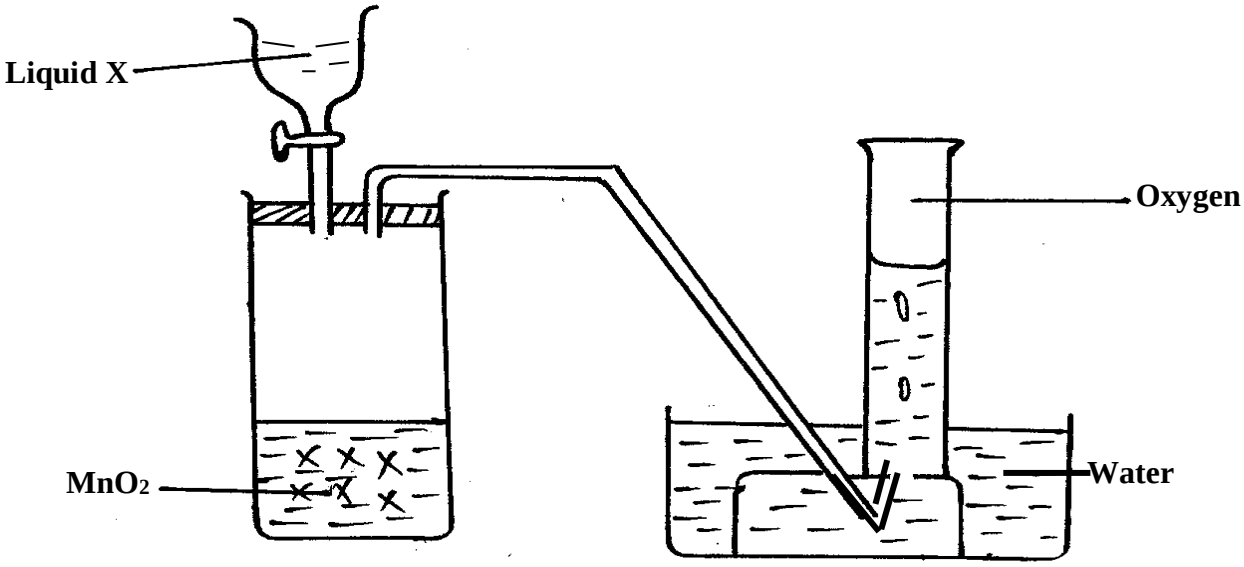
TIME: 2 HOURS

NAME…….. ADM NO…….....

SIGN……..……. DATE;……...

Answer All the questions in the spaces provided

1. The diagram below shows oxygen can be prepared in a laboratory. Study it and answer the questions that follow.



a) Name the liquid **X** **1mark)**

……

b) Write a balance chemical equation to shows how oxygen is produced in the boiling tube. **(1mark)**

……

c) Give one industrial use of oxygen **(1mark)**

……

……

2. Metal **X** reacts with cold water slowly while Y does react with neither cold water nor hot water. Metal **Z** react with both cold water and hot water vigorously and explosively respectively. Arrange these metals in order of increasing reactivity **(2mark)**

……

……

……

c) Explain the observation made in (b) above **(1mark)**

……

……

3. The grid below shows part of the periodic table. The letters do not represent the actual symbols of elements.

P	**Q**						**X**	
				Z			**Y**	

(a) Compare

(i) Atomic radii of **P** and **Q** **(1mark)**

……

……

(ii) Reactivity of **X** and **Y** **(1mark)**

……

……

(b) Write the chemical formula of a compound formed by **Q** after reacting with **X**. **(1mark)**

4. Using dots**(.)** and crosses **(x)** show the bonding

NH_4^+ **(1mark)**

H_2O **(1mark)**

5. (a)Name two allotropes of carbon. **(1mark)**

……

……

Explain why diamond is very hard. While graphite is very soft**.** **(2marks)**

……

……

……

Carbon (II) oxide is a 'silent killer'. Explain**.** **(2marks)**

……

……

……

6. Name the following processes;

a) When anhydrous calcium chloride is left in an open beaker overnight a solution was formed.

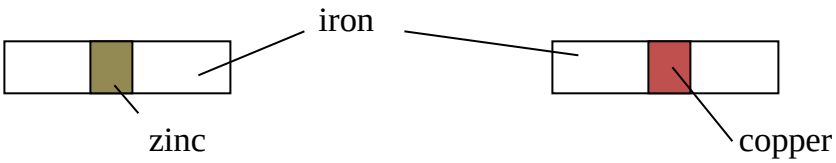
(1mk)

……

b) When sodium carbonate decahydrate crystals are left in an open beaker for some days it turned into a powder**.** **(1mk)**

……

7. In an experiment, two pieces of iron sheets were wrapped in each case with zinc and copper metal sheets as shown below. They were left in the open for some months.



(I) (II)

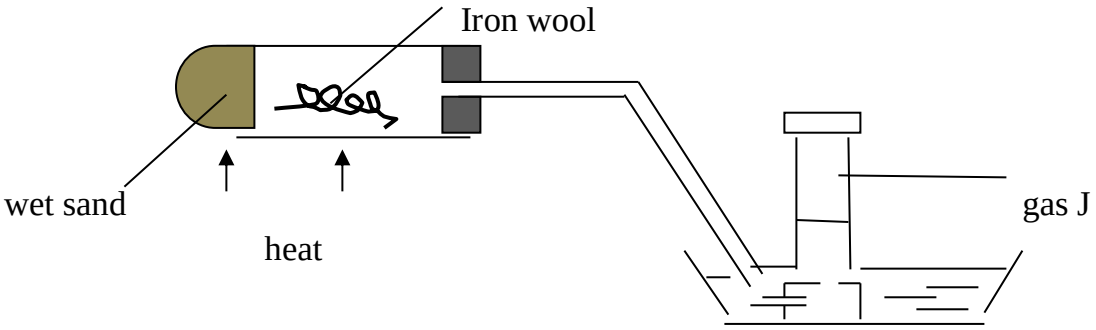
State and explain the observations made in the experiments**;** **(3mk)**

……

……

……

8.Study the diagram below and answer the questions that follow.



a) Name gas J **(1mk)**

……

b) Explain why its important to heat the wet sand before heating the iron wool. **(1mk)**

……

……

c) Name the product formed in the combustion tube**.** **(1mk)**

……

……

9.Solutions can be classified as acids, bases or neutral. The table below shows solutions and their pH values

Solution	Ph – values
K	1.5
L	7.0
M	14.0

Select any pair that would react to form a solution of pH 7 **(1 Mark)**

……

……

Identify two solutions that would react with aluminium hydroxide. Explain

……

……

(2 Marks)

10. Oxygen gas can be prepared in the laboratory by heating potassium nitrate.

(a) Write the equation of reaction to show the decomposition of potassium nitrate***(1 Mark)***

……

……

(b) State two physical properties of oxygen gas ***(1 Mark)***

……

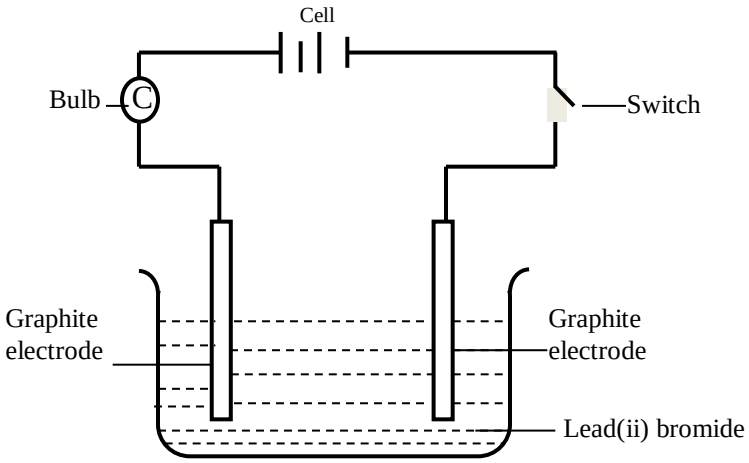
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Outline one industrial use of oxygen gas ***(1 Mark)***

……

……

11.Study the set-up below for electrolysis of molten lead(ii) bromide using grahite electrodes.



(a) Write ionic equations for reactions that took place at

I Anode ***(½ Mark)***

II. Cathode ***(½ Mark)***

(b) State the observation made at each electrode

I. Anode ***(½ Mark)***

II. Cathode ***(½ Mark)***

(c) State and explain the observations made on the electrolyte ***(1 Mark)***

……

……

12.(a) State the role of the following parts during fractional distillation of a mixture of water and ethanol

(i) Glass beads in the fractionating column ***(1 Mark)***

……

(ii) Fractionating column ***(1 Mark)***

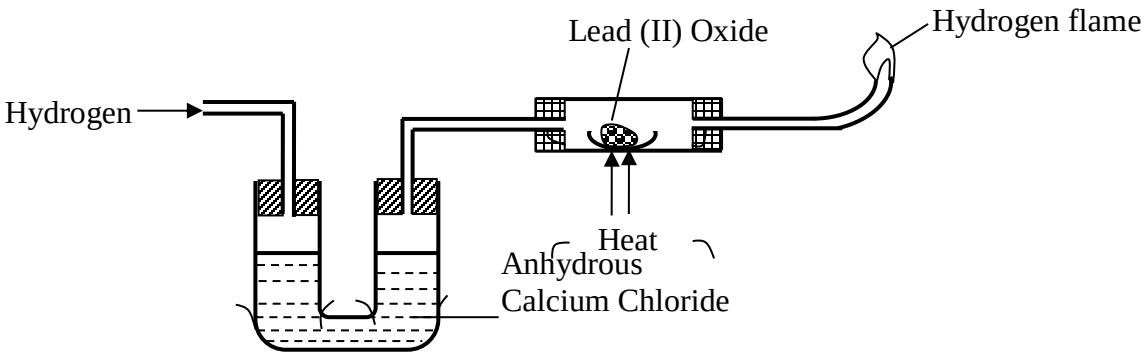
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(b) State any one application of fractional distillation ***(1 Mark)***

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……

13.



(i) Write an equation for the reaction that takes place in the tube ***(1 Mark)***

……

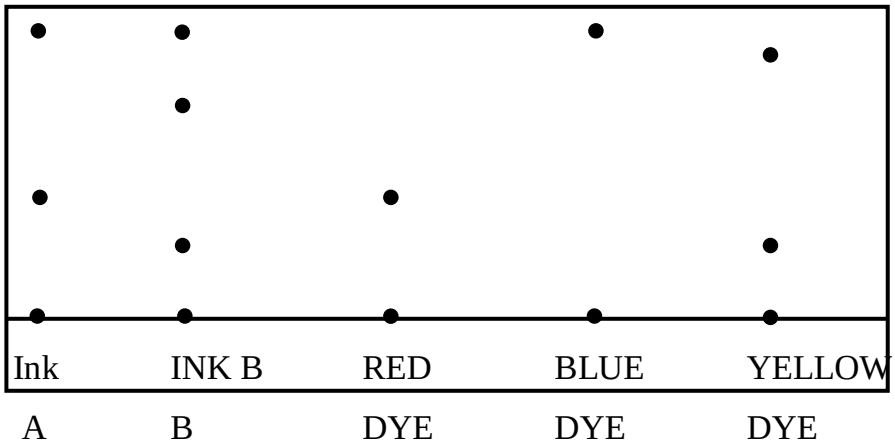
(ii) What property of hydrogen makes this reaction possible? ***(1 Mark)***

……

(iii) What would you expect to happen, if sodium oxide (Na_2O) was used instead of Lead (II) oxide? ***(1 Mark)***

……

14. The chromatogram of two inks and three dyes is drawn below.



(a) Name the colours of ink A ***(1 Mark)***

……

(b) Suggest how separated components can be recovered ***(1 Mark)***

……

……

(d) Suggest two reasons why separations occur in this method ***(1 Mark)***

……

……

15.(a) Why is reaction between calcium and dilute sulphuric (VI) acid not used in preparation of hydrogen gas ***(2 Marks)***

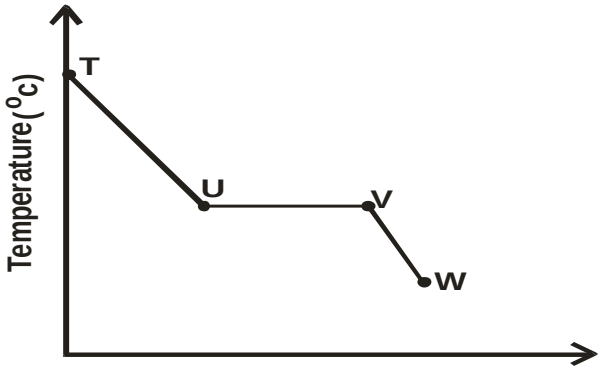
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(b) Calcium is an element in period 2, what do members of the period have in common?***(1 Mark)***

……

16. The sketch below shows a graph of temperature against time obtained when a gaseous substance was cooled.



Explain what happens to the gaseous substance between:

a) T and U **(1 mark)**

……

……

U and V **(1 mark)**

……

……

V and W **(1 mark)**

……

……

17. Diamond and graphite are both allotropes of carbon. Explain why graphite is a good conductor of electricity while diamond is not.

……

……

FORM 2 EXAMINATION TRIALS

CHEMISTRY

PRACTICE TEST 4

TIME: 2 HOURS

NAME…….. ADM NO…….....

SIGN……..……. DATE;……...

Answer All the questions in the spaces provided

1((a). The table below shows some properties of chlorine, bromine and iodine .

element	formula	Colour and state room temperature	Solubility in water
Chlorine	Cl_2	(i)	Soluble
Bromine	Br_2	Brown liquid	(ii)
iodine	I_2	(iii)	Slightly soluble

Complete the table by giving the missing information in (i), (ii) and (iii) **above.** **(3mks)**

(b). Chlorine gas is prepared by reacting concentrated hydrochloric acid with either Manganese (IV) oxide or Potassium permanganate.

(i). Write the equation for the reaction between concentrated hydrochloric acid and Manganese (IV) oxide**.** **(1mk)**

……

……

(ii). What is the role of manganese (iv) oxide in this reaction**?** **(1mk)**

……

……

(iii). When potassium permanganate is used instead of manganese (iv) oxide, heating is not required. Explain**.** **(1mk)**

……

……

(iv). Give two advantages of using potassium permanganate over manganese (IV) oxide**.** **(2mks)**

……

……

(v). Iron metal reacts with chlorine to form substance E. identify substance E. **(1mk)**

……

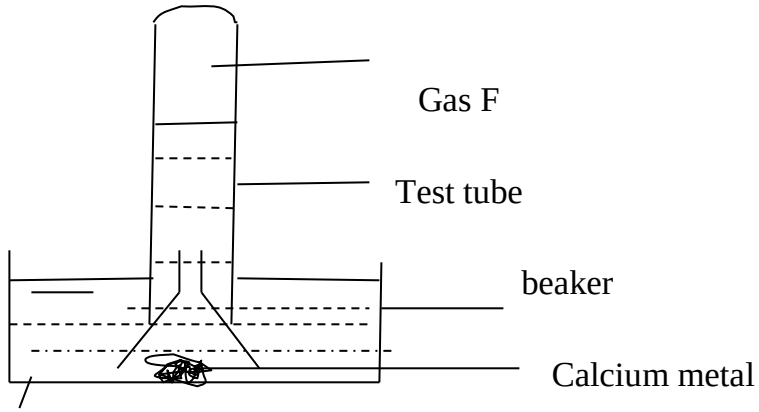
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(vi). Write a chemical equation to represent the reaction in (V) **above.** **(1mk)**

……

……

(c). The set up below was used to collect gas F produced between water and calcium metal.



(i). Name gas F**.** **(1mk)**

……

(ii). Write an equation for the production of gas F**.** **(1mk).**

……

……

(iii). At the end of the experiment, the solution in the beaker was found to be a weak base. Explain why the solution was a weak base**.** **(2mks)**

……

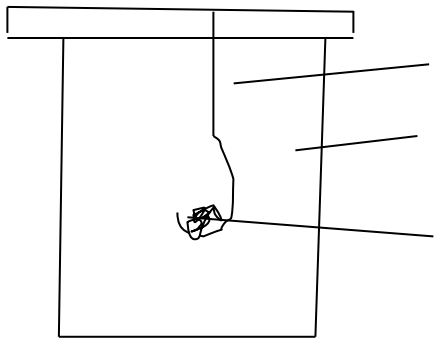
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(iv). Give one laboratory use of the solution formed in the beaker**.** **(1mk)**

……

……

2(a). The set op below was used to investigate the reaction of sodium metal with chlorine gas. Study it and answer the questions that follow.



(i). State two observations that would be made in the gas jar**.** **(2mks)**

……

……

(ii). Write an equation for the reaction that occurred. **(1mk)**

……

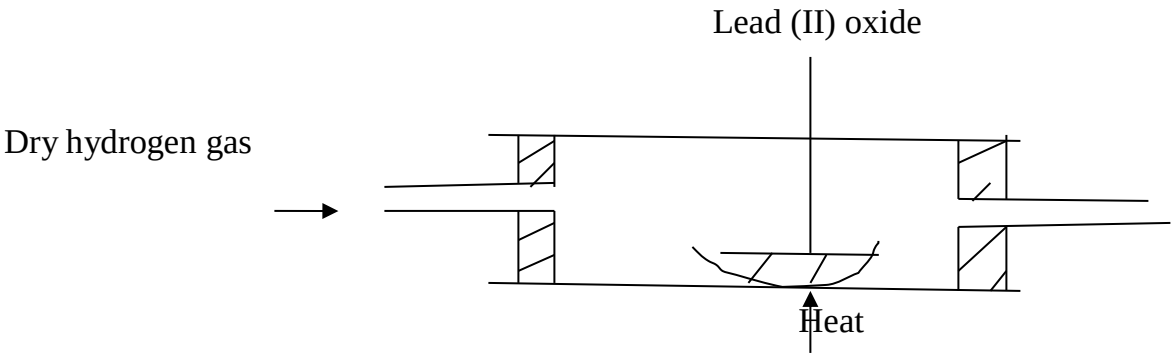
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(iii). Name one use of the product formed**.** **(1mk)**

……

……

(b). In an experiment , dry hydrogen gas was passed over heated lead (II) oxide as shown below.



(i). State the two observations made in the combustion tube after the experiment**.** **(2mks)**

……

……

(ii). Write a chemical equation for the reaction that occurred in the combustion tube**.** **(1mk)**

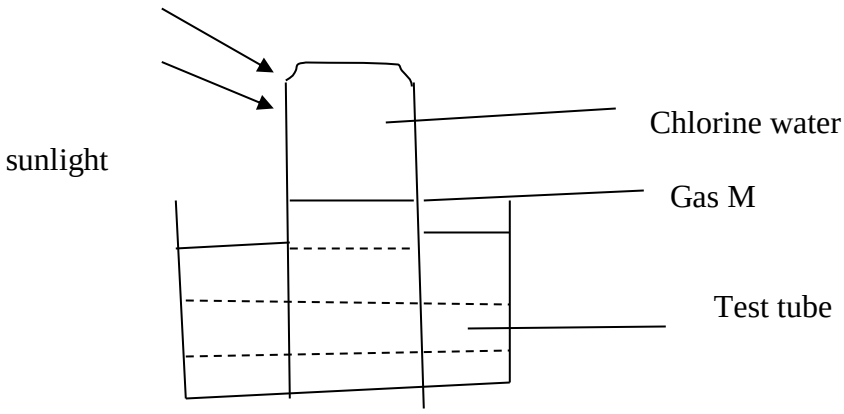
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(iii). What property of hydrogen gas is shown by the reaction in b (ii) above**?** **(1mk)**

……

……

3. In an experiment, a test tube of chlorine gas was inverted in water as shown in the diagram. It was then left to stand in sunlight for one day.



After one day, a gas M was found to have collected in the test tube as shown above.

(i). identify gas M**.** **(1mk)**

……

(ii). Suggest whether the PH of the solution the beaker would increase or decrease after one day. Give an explanation. **(2nks)**

……

……

(iii). The colour of chlorine water was observed to have changed from pale yellow to colorless after one day. Explain. **(2mks)**

……

……

(iv) Write an equation to support your answer in 3(iii) above**.** **(1mk)**

……

(v). State and explain the observation made when a moist blue litmus paper was placed at the mouth of the test tube containing chlorine gas**.** **(3mks)**

……

……

……

(vi). Write an equation to show how the process in 3(v) above occurs**.** **(1mk)**

……

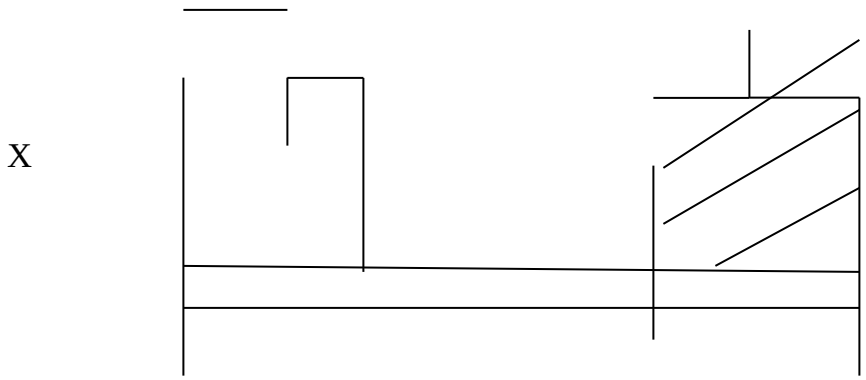
……

(vii). Give two uses of chlorine gas**.** **(2mks)**

……

……

4(a). The chart below is an outline of part of the periodic table.



(i). With the help of vertical and horizontal lines , indicate the direction of increasing non-metallic nature of the elements.

(2mks)

(ii). Which type of elements are represented :

By X **?** **(1mk)**

In the shaded area? **(1mk)**

(b)(i). Element A is in the same group of the periodic table as chlorine. Write the formula of the compound formed when A reacts with magnesium. **(1mk)**

……

……

(ii). Soot is one of the environmental pollutants.

I.Explain the term pollutant. **(1mk)**

……

……

II.State how soot is formed from hydrocarbons. **(1mk)**

……

……

(iii). What role do the following play in the commercial preparation of oxygen gas?

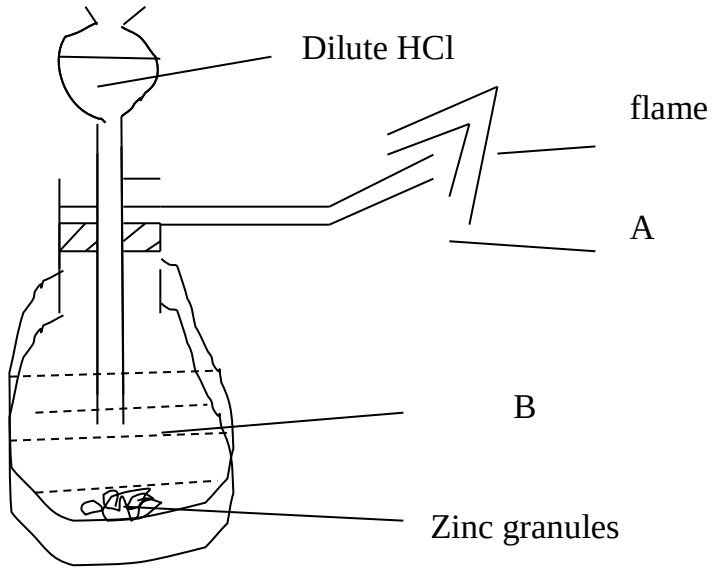
Concentrated sodium hydroxide. **(1mk)**

……

Concentrated Sulphuric (VI) acid**.** **(1mk)**

……

(b). Study the diagram below and answer the questions that follow.

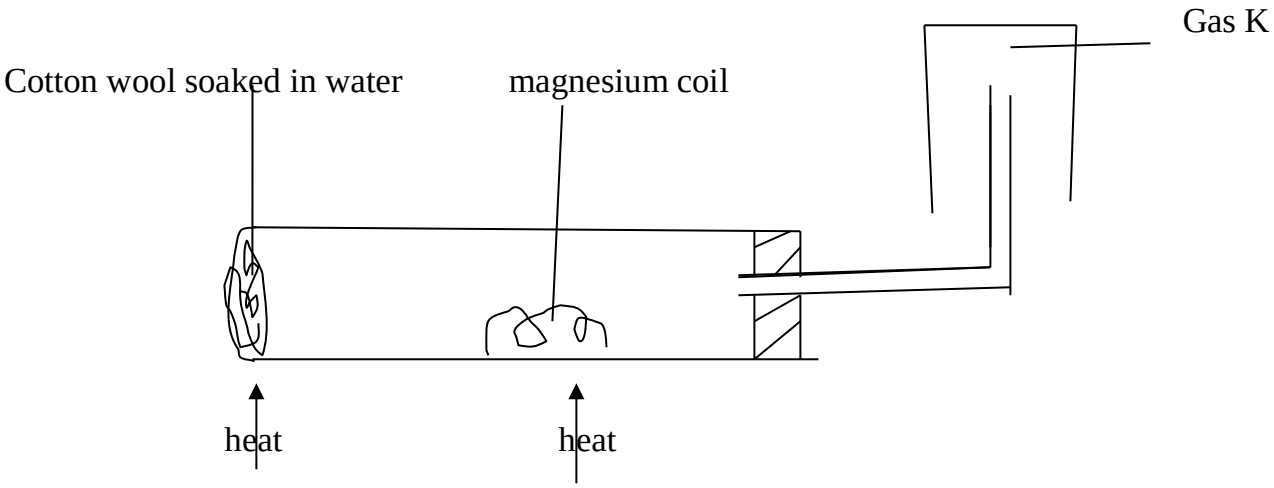


(i). Write a chemical equation for the reaction that occurred at points:

I. **A** **(1mk)**

II. **B** **(1mk)**

(ii). A student set up the experiment bellow to collect gas K. the glass wool was heated before heating the magnesium coil.



(a). Explain why it was necessary to heat the moist cotton wool before heating the magnesium.

(2mks)

……

……

……

(b). Identify gas K. **(1mk)**

……

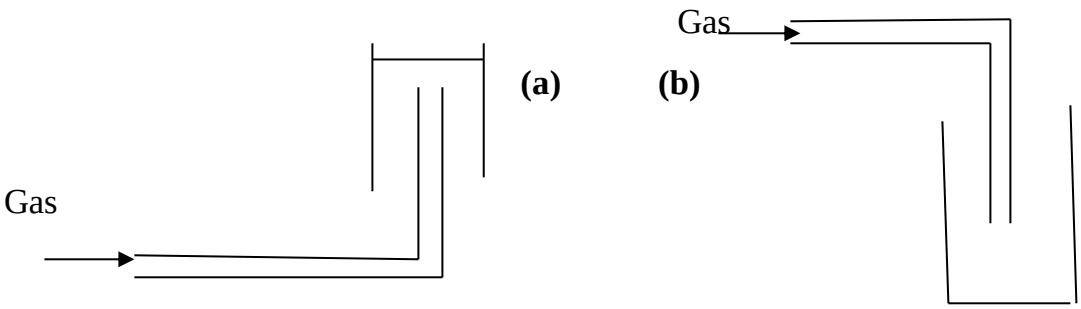
(c).what property of gas K makes it possible to be collected by the method shown? **(1mk)**

……

(d). Write a chemical equation for the reaction that produced gas K. **(1mk)**

……

(e). The diagram represents two methods of gas collection in the laboratory.



(i). Name the methods of gas collection above. **(2mks)**

……

……

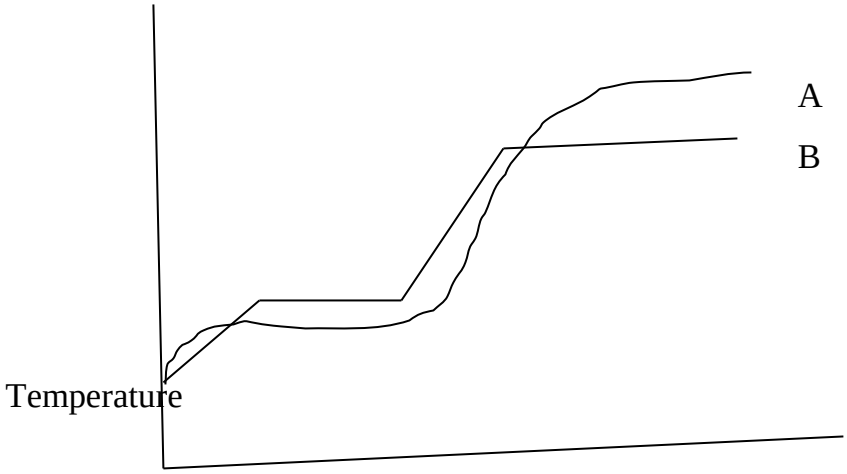
(ii). Which method is suitable for collecting dry carbon (IV) oxide gas? Give a reason .

(2mks)

……

……

The curves bellow represent the variation of temperature with time when pure and impure samples of a solid were heated separately.



(a). Which curve represents the variation in temperature for pure solid? Explain**.** **(2mks)**

……

(b) State the effect of an impurity on the melting and boiling points of a pure substance**.** **(2mks)**

……

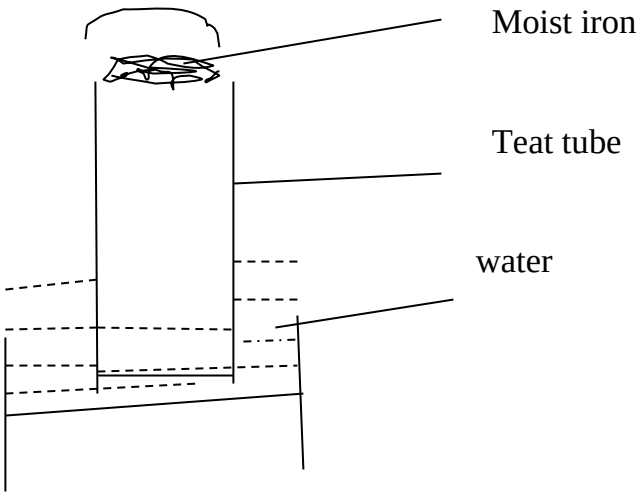
……

(c). Name two gases used with oxygen in welding. **(2mks)**

……

……

6. The set up bellow was used to study some properties of air.



.Draw another diagram to show the level of water in the test tube after 24 hours. Explain the observations**.** **(3mks)**

(ii). State and explain one observation made on the moist iron after 24 hours. **(2mks)**

……

……

……

(iii). State one disadvantage of rusting**.** **(1mk)**

……

……

(iv). Fractional distillation of liquid air is usually used to separate various gaseous mixtures in air. Explain how nitrogen is obtained**.** **(1mk)**

……

……

(v). The PH of a soil sample in a given area was found to be 5.5. an Agricultural officer the addition of lime (calcium oxide). State the function of lime in the soil. **(1mk)**

……

……

FORM 2 EXAMINATION TRIALS

CHEMISTRY

PRACTICE TEST 5

TIME: 2 HOURS

NAME…….. ADM NO…….....

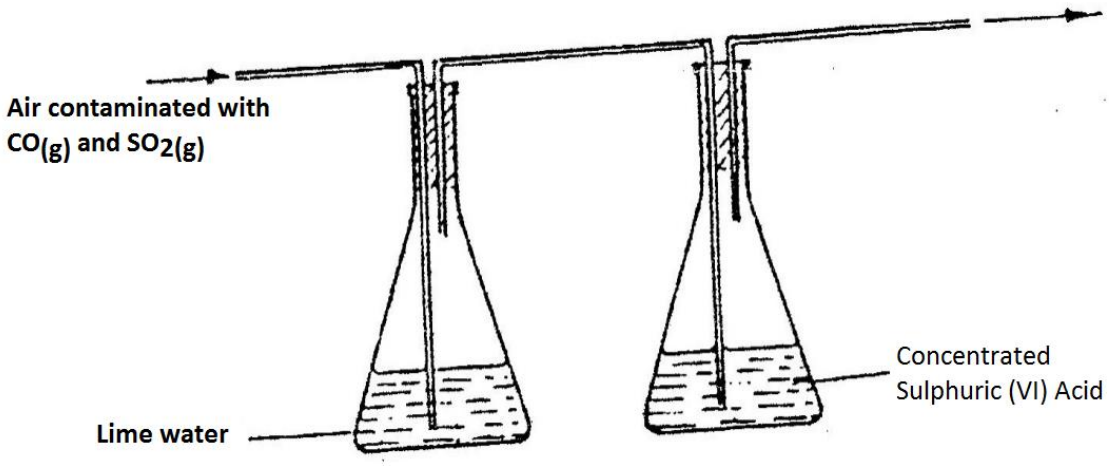
SIGN……..……. DATE;……...

Answer All the questions in the spaces provided

1. Complete the table below for the characteristics of the sub atomic particles. **(2marks)**

sub atomic particle	Relative mass	Electrical charge
Proton	1	
Neutral	1	

2. A sample of air contaminated with carbon monoxide and sulphur dioxide was passed through the apparatus shown in the diagram below.



Which contaminant was removed by passing the contaminated air through the apparatus? Explain.

(2mks)

……

……

……

3. Explain how you would obtain solid lead carbonate from a mixture of lead carbonate and sodium carbonate powders. **(3mks)**

……

……

……

4. Describe how the following reagents can be used to prepare copper (II) hydroxide, solid copper (II) sulphate, solid sodium hydroxide and distilled water. **(3mks)**

……

……

……

……

5. Aluminium metal is a good conductor and is used for overhead cables. State any other two properties that make aluminium suitable for this use. **(2mks)**

……

……

……

6. State with reasons whether the changes below are physical or chemical. **(3mks)**

CHANGE	TYPE OF CHANGE	REASON
I. Heating iodine crystals gently.		
II. Formation of brown coating on iron when exposed to moist air.		
III. Heating Zinc oxide IV.		

7. The table below shows the relative molecular masses and the boiling points of methane and water.

	Relative molecular mass	Boiling point(^oC)
Methane	16	-161
Water	18	100

Explain why the boiling point of water is higher than that of methane. **(2mks)**

……

……

……

8. (a. Two solutions J and K were tested with blue litmus papers and methyl orange indicator.

Blue litmus remained blue in both solutions. Methyl orange remained orange in K but turned yellow in J.

(a) What is the nature of substance J? Explain. **(2 marks)**

……

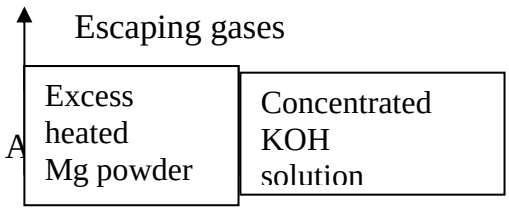
……

(b) Give an example of a substance that K is likely to be. **(1mark)**

……

……

9. Air was passed through several reagents as shown in the flow chart below.



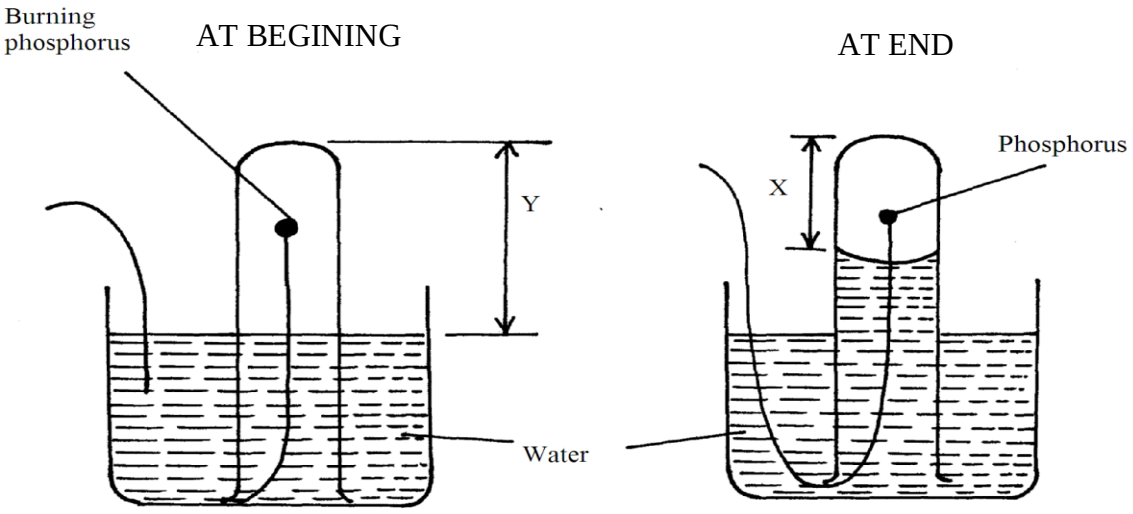
(a) Write an equation for the reaction which takes place in chamber with magnesium powder.**(1mk)**

……

(b) Name one gas, which escapes from the chamber containing magnesium powder. Give a reason for your answer. **(2mks)**

……

10. A student set-up the apparatus below in order to determine the percentage by volume of oxygen in air.



a) Why did water rise when the reaction had stopped? **(1mk)**

……

……

b) The student wrote the expression for the percentage by volume of oxygen in air as

$$\frac{y-x}{y} \times 100\%$$

Why was the volume of oxygen calculated using the above expression incorrect? **(1mk)**

……

……

c) What should have been done after the reaction had stopped in order to get a correct volume. **(1mk)**

……

……

11. Study the table below.

Ion	Electronic configuration
L^-	2,8,8
M^{2+}	2,8
N^{3+}	2,8,8

(a) Which elements belong to the same period of the periodic table**?** **(1 mark)**

(b) What is the formula of the compound formed by L and N.? **(1 mark)**

(c) Compare the atomic and ionic radii of element L**.** **(1 mark)**

---

12. In temperate countries, salt is sprayed on roads to defrost and clear roads but the long term effect on this practice is costly to motorist.

Explain the role of salt in defrosting the ice. **(1mk)**

……

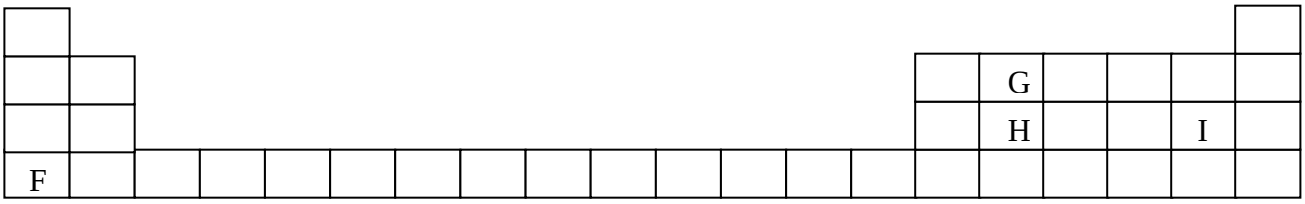
……

Explain why the long term effect is costing to motorist. **(1mk)**

……

……

13. The grid below shows part of a periodic table. The letters do not represent the actual symbols of the elements



Select the:

(i) Element which has the largest atomic radius. **(1mk)**

……

……

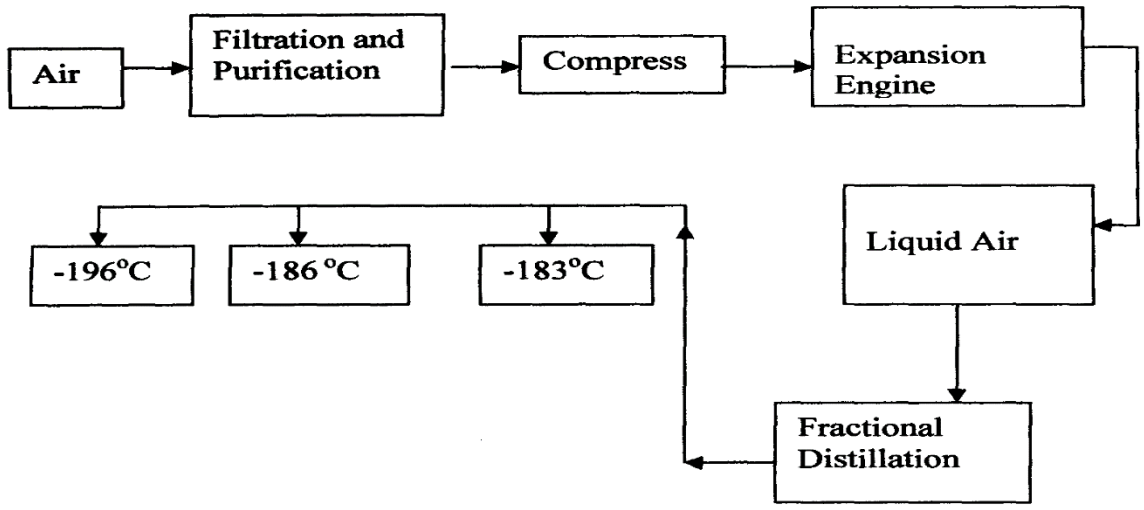
(ii) Most reactive non-metal. **(1mk)**

……

……

b) Show on the grid the position of the element J which forms J^{2-} ions with electronic configuration 2, 8, 8. **(1mk)**

14. Oxygen is obtained on large scale by the fractional distillation of air as shown on the flow chart below.



a) Explain why air is considered as a mixture **(1mk)**

……

……

b) Identify the substance that is removed at the filtration stage **(1mk)**

……

c) Explain why Carbon (IV) oxide and water are removed before liquefaction of air. **(1mk)**

……

……

d) Identify the component that is collected at -186°C **(1mk)**

……

15. Study the table below and answer the questions that follow:-

Substance		A	B	C	D	E	F
Melting Point (°C)		801	113 OR 119	-39	5	-101	1356
Boiling point (°C)		1410	445	457	54	-36	2860
Electrical Conductivity	Solid	Poor	Poor	Good	Poor	Poor	Poor
	liquid	Good	Poor	Good	Poor	Poor	Poor

Identify with reasons the substances that:

(i) Have a metallic structure **(2mks)**

……

……

……

(ii) Have a molecular structure **(2mks)**

……

……

……

(iii) Substances A and C conduct electric current in the liquid state. State how the two substances differ as conductors of electric current **(2mks)**

……

……

……

16. Atoms of element X exists as $^{14}_{6}X$ and $^{12}_{6}X$

(a) What name is given to the two types of atoms. **(1mk)**

……

(b) Use dot (·) and cross (x) diagrams to illustrate the atomic structure of $^{14}_{6}X$ **(2mks)**

……

……

……

……

17. Give 2 reasons why most laboratory apparatus are made of glass**.** **(1mk)**

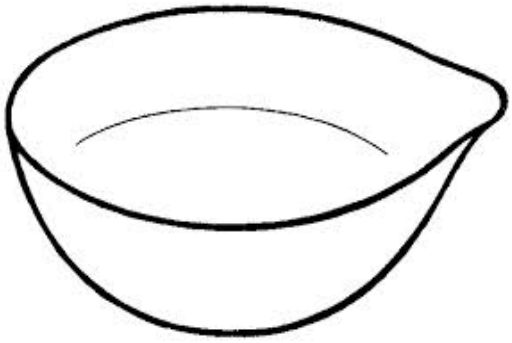
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……

……

(b) The diagrams below are some common laboratory apparatus. Name each apparatus and state its use. **(2mks)**





Name **Name:**

Use **Use:**

18. Soot is one of the environmental pollutants.

(i) Explain the term pollutant. **(1mk)**

……

……

(ii) State how soot is formed from hydrocarbons. **(1mk)**

……

……

19. Phosphorus element smoulders in air to form two oxides

(a) Name the two oxides. **(2 mks)**

(i) _____

(ii) _____

(b) State the nature of the solution when the above mentioned oxides are dissolved in water. **(1mk)**

……

……

20. (a) What is meant by the terms: **(2 mark)**

(i) Atom

……

……

(ii) Mass number

……

……

(b) The formula of element T is TCl_3. What is the formula of its sulphate? **(1mk)**

……

……

21. Crystals of sodium carbonate decahydrate ($Na_2CO_3 . 10H_2O$) were exposed to air for about four days.

(i) State what was observed. **(1mk)**

……

(ii) Name the process that took place**.** **(1mk)**

……

(ii) Write an equation for the reaction that occurred. **(1mk)**

……

22. Explain why molten calcium chloride conducts electricity while silicon (IV) oxide does not.

(2mks)

……

……

……

23. The table below gives the first ionization energy of three elements

Element	A	B	C
1st ionization energy(kJ/mol)	496	419	520

(i) Define the term first ionization energy. **(1mk)**

……

……

(ii) Select the element that is the most reactive. Explain. **(2mks)**

……

……

……

……

24. State the colour of the indicators in the solutions given in the table below: **(3mks)**

	Colour in	
Indicator	**Acid**	**Base**
Litmus	Red	
Methyl orange		Yellow
Phenolphthalein	Colourless	

FORM 2 EXAMINATION TRIALS

CHEMISTRY

PRACTICE TEST 6

TIME: 2 HOURS

NAME…….. ADM NO…….....

SIGN……..……. DATE;……...

Answer All the questions in the spaces provided

1. Define the following terms:

Atomic Number **(1mk)**

……

……

Mass Number **(1mk)**

……

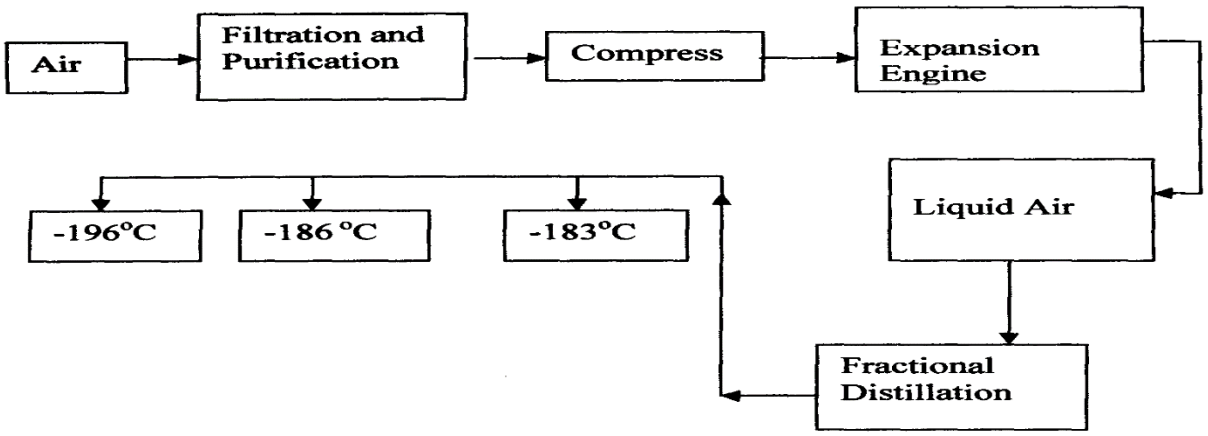
……

The Isotopes **(1mk)**

……

……

2. Oxygen is obtained on large scale by the fractional distillation of air as shown on the flow chart below.



a) Explain why air is considered as a mixture **(1mk)**

……

……

b) Identify the substance that is removed at the filtration stage **(1mk)**

……

c) Explain why Carbon (IV) oxide and water are removed before liquefaction of air. **(1mk)**

……

……

d) Identify the component that is collected at -186°C **(1mk)**

……

3. Study the table below and answer the questions that follow:-

Substance		A	B	C	D	E	F
Melting Point (^oC)		801	113 OR 119	-39	5	-101	1356
Boiling point (^oC)		1410	445	457	54	-36	2860
Electrical Conductivity	Solid	Poor	Poor	Good	Poor	Poor	Poor
	liquid	Good	Poor	Good	Poor	Poor	Poor

Identify with reasons the substances that:

(i) Have a metallic structure **(2mks)**

……

……

(ii) Have a molecular structure **(2mks)**

……

……

(iii) Substances A and C conduct electric current in the liquid state. State how the two substances differ as conductors of electric current **(2mks)**

……

……

……

……

4. Atoms of element X exists as $^{14}_{6}X$ and $^{12}_{6}X$

(a) What name is given to the two types of atoms. **(1mk)**

……

……

(b) Use dot (·) and cross (x) diagrams to illustrate the atomic structure of $^{14}_{6}X$ **(2mks)**

……

……

……

……

5. Give two reasons why most laboratory apparatus are made of glass. **(2mk)**

……

……

……

6 . Define the following terms:

A saturated solution. **(1mk)**

……

……

Crystallization. **(1mk)**

……

……

Describe how copper (II) sulphate crystals can be obtained from copper (II) sulphate solution.

(3mks)

……

……

……

……

Study the table below and use it to answer the questions that follows. Letters are not the actual symbols of the elements

Ion	Electronic configuration
L^-	2,8,8
M^{2+}	2,8
N^{3+}	2,8,8

Which elements belong to the same period of the periodic table**?** **(1 mark)**

What is the formula of the compound formed by L and N.? **(1 mark)**

Compare the atomic and ionic radii of element L**.** **(1 mark)**

Write the chemical fomular of the following compounds. **3mks**

Sodium sulphate

Magnesium hydroxide

Calcium nitrate.

11. State the reasons why carbon (iv) oxide is used by ice cream venders instead of ordinary ice.

(2mks)

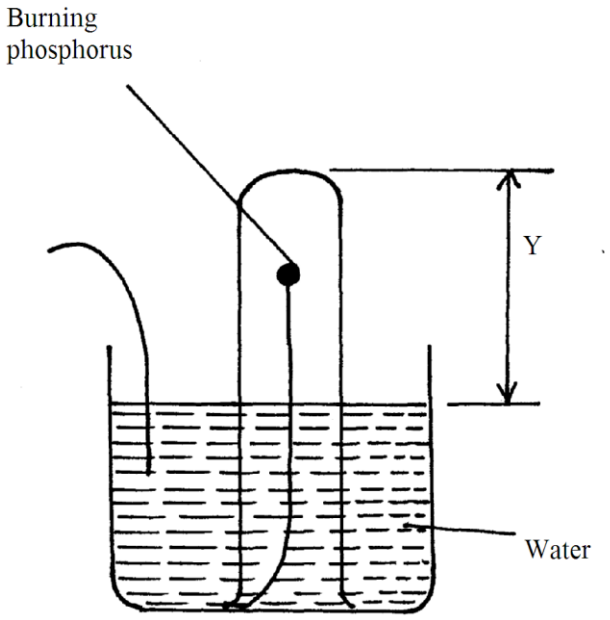
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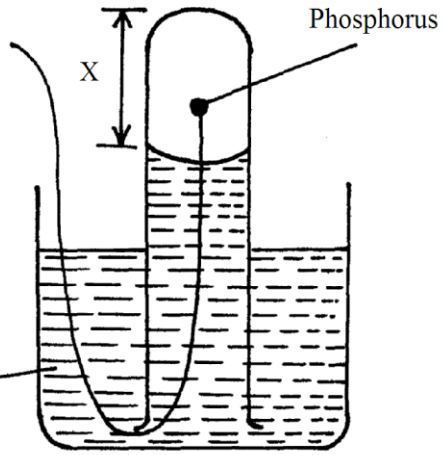
……

12. A student set-up the apparatus below in order to determine the percentage by volume of oxygen in air.

AT BEGINING



AT END



a) Why did water rise when the reaction had stopped? **(2mks)**

……

……

b) The student wrote the expression for the percentage by volume of oxygen in air as

$$\frac{y-x}{y} x100\%$$

Why was the volume of oxygen calculated using the above expression incorrect? **(1mk)**

……

……

c) What should have been done after the reaction had stopped in order to get a correct volume.

(1mk)

……

……

12. Explain how you would obtain solid lead carbonate from a mixture of lead carbonate and sodium chloride. **(3mks)**

……

……

……

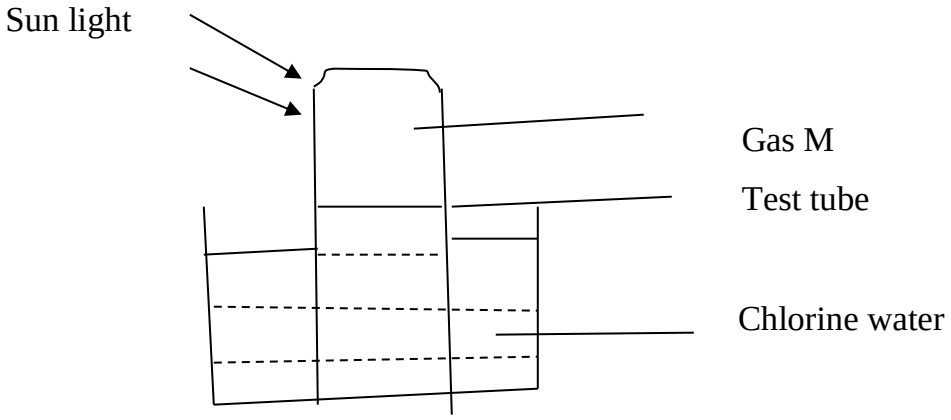
13. Aluminium metal is a good conductor and is used for overhead cables. State any other two properties that make aluminium suitable for this use. **(2mks)**

……

……

……

14. In an experiment, a test tube of chlorine gas was inverted in water as shown in the diagram. It was then left to stand in sunlight for one day.



At the end of experiment (after one day)

After one day, a gas M was found to have collected in the test tube as shown above.

(i). identify gas M**.** **(1mk)**

……

(ii). Suggest whether the PH of the solution in the beaker would increase or decrease after one day. Give an explanation**.** **(2mks)**

……

……

(iii). The colour of chlorine water was observed to have changed from pale yellow to colourless after one day. Explain**.** **(2mks)**

……

……

(iv) Write an equation to support your answer in (iii) above**.** **(1mk)**

……

(v). State and explain the observation made when a moist blue litmus paper was placed at the mouth of the test tube containing chlorine gas.

(3mks)

……

……

……

(vi). Write an equation to show how the process in (v) above occurs**.** **(1mk)**

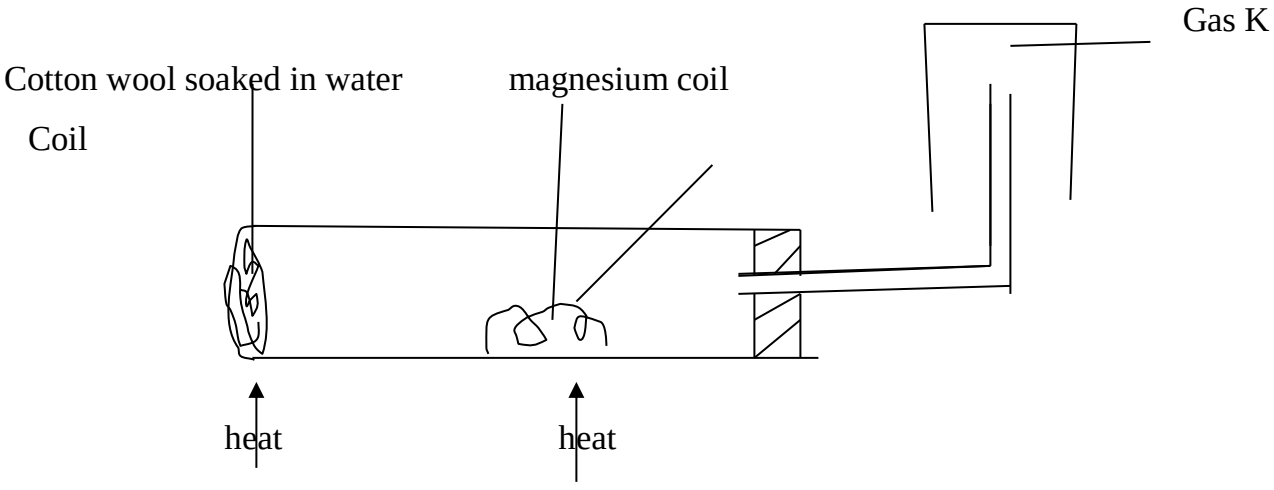
……

(vii). Give two uses of chlorine gas**.** **(2mks)**

……

……

15. A student set up the experiment below to collect gas K. the glass wool was heated before heating the magnesium coil.



(a). Explain why it was necessary to heat the moist cotton wool before heating the magnesium.

(2mks)

……

……

……

(b).Identify gas K. **(1mk)**

……

……

(c).what property of gas K makes it possible to be collected by the method shown? **(1mk)**

……

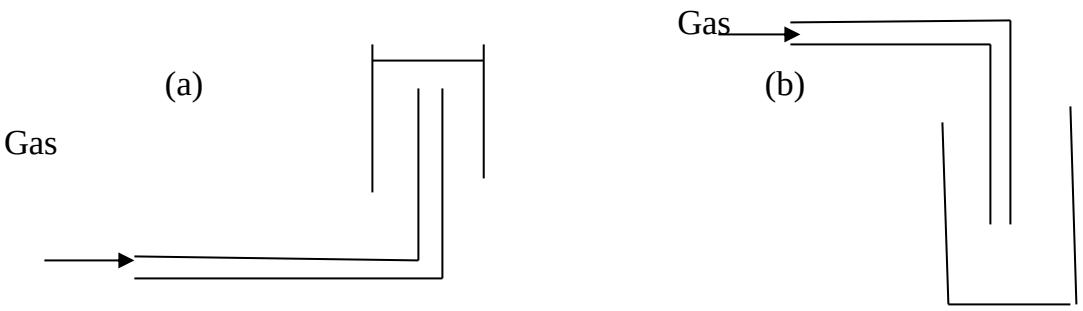
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(d). Write a chemical equation for the reaction that produced gas K. **(1mk)**

……

……

16. The diagram represents two methods of gas collection in the laboratory.



(i). Name the methods of gas collection above. **(2mks)**

……

(ii). Which method is suitable for collecting dry carbon (IV) oxide gas? Give a reason. **(2mks**)

……

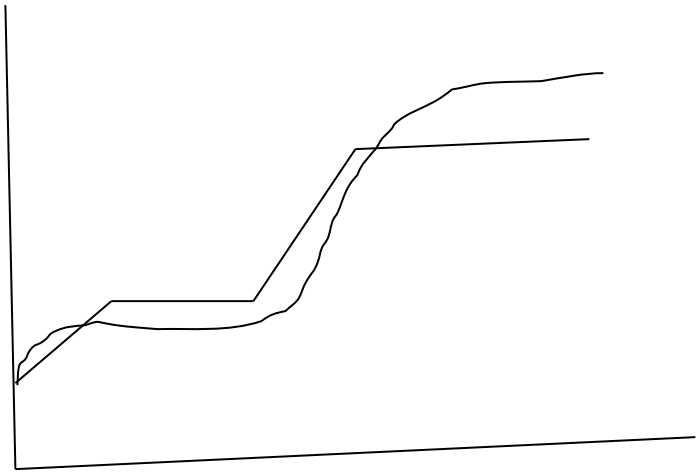
……

17. The curves bellow represent the variation of temperature with time when pure and impure samples of a solid were heated separately.

A

B

Temperature



(a). Which curve represents the variation in temperature for pure solid? Explain. **(2mks)**

……

……

……

(b) State the effect of an impurity on the melting and boiling points of a pure substance**.** **(2mks)**

……

……

……

18. Cars in Mombasa are found to rust faster than cars in Nairobi. Explain. **(2 mks)**

……

……

……

(iii). State one disadvantage of rusting**.** **(1mk)**

……

……

19. The PH of a soil sample in a given area was found to be 5.5. An Agricultural officer the addition of lime (calcium oxide). State the function of lime in the soil. **(1mk)**

……

……

20. By use of dot (.) and cross (x) diagram show bounding in magnesium chloride ($mgCl_2$) **(2mks)**

FORM 2 EXAMINATION TRIALS

CHEMISTRY

PRACTICE TEST 7

TIME: 2 HOURS

NAME…….. ADM NO…….....

SIGN……..……. DATE;……...

Answer All the questions in the spaces provided

1. Define the following:

Element **(1mk)**

……

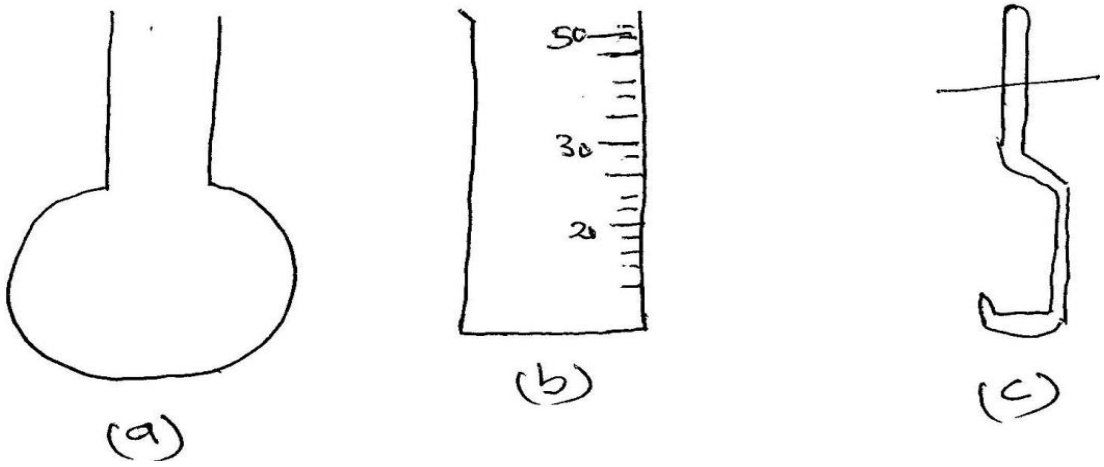
……

Ion **(1mk)**

……

……

2. i) Identify the following apparatus and give a use for each **(3mks)**



a) ……..Use…….

b) ……..Use…….

c) ……..Use…….

ii) Name another apparatus that can be used in place of (b) **(1mk)**

……

3. Give four reasons why most apparatus are made of glass **(4mks)**

4. Define the following terms

Isotope **(1mk)**

……

……

Ionization energy **(1mk)**

……

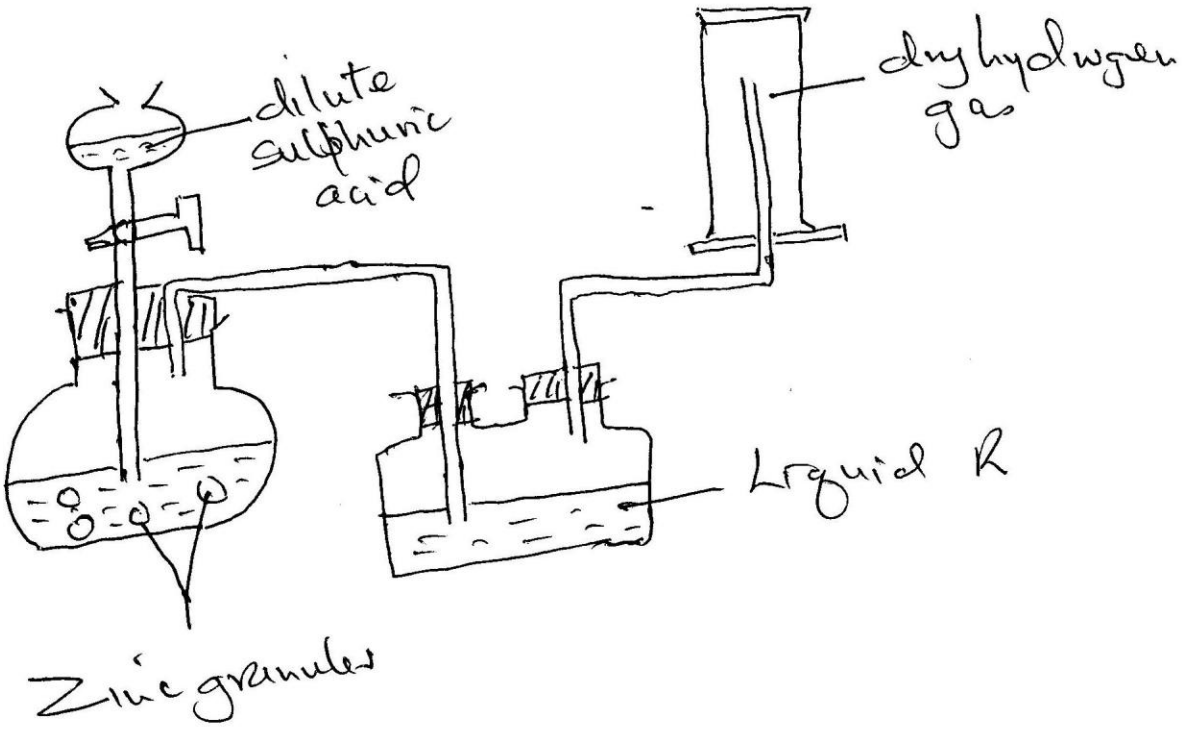
……

Electron affinity **(1mk)**

……

……

5. Hydrogen gas was prepared in the lab. Using the following set up



Write an equation for the reaction taking place and balance it **(2mks)**

……

……

Name the method used to collect the gas and give a property of hydrogen that enables it to be collected through the method. **(2mks)**

……

……

……

Name liquid R and state its function in the set up **(2mks)**

Liquid R: …….

Function:……

Explain why it is not advisable to use sodium metal in place of zinc metal **(2mks)**

……

……

……

State two uses of hydrogen gas **(2mks)**

……

……

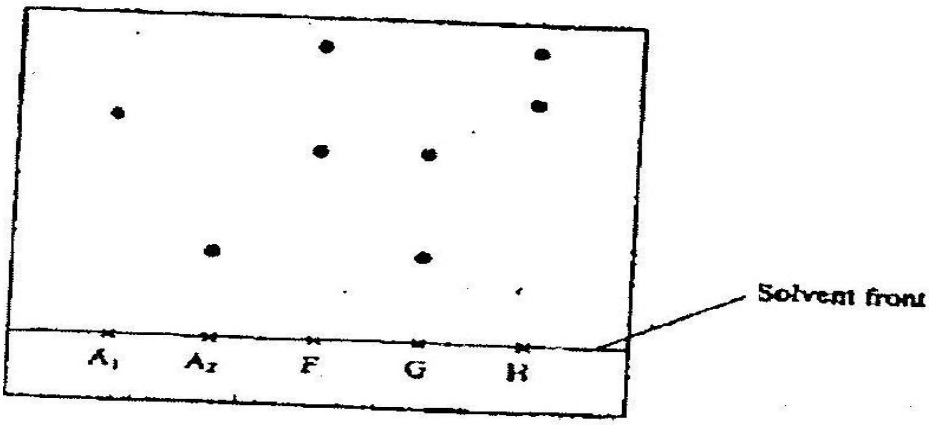
What will happen to the pH of the solution in the beaker after one day? Give an explanation. **(2mks)**

……

……

……

6. Samples of urine from three participants F, G and H at an international sports meeting were spotted onto a chromatography paper alongside two from illegal drugs A1 and A2. A chromatogram was run using methanol. The figure below shows the chromatogram.



Identify the athlete who had used an illegal drug **(1mk)**

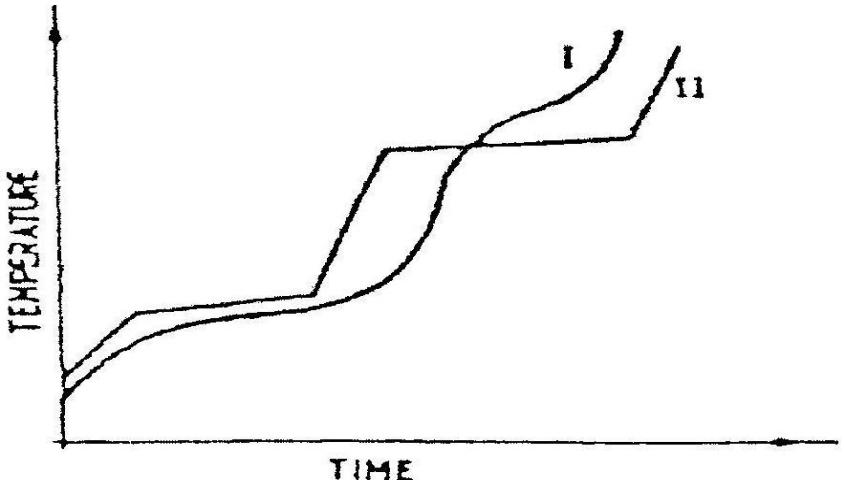
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Which drug is more soluble in methanol? **(1mk)**

……

……

7. The curve below represents the variation of temperature with time when pure and impure samples of a solid were heated separately.

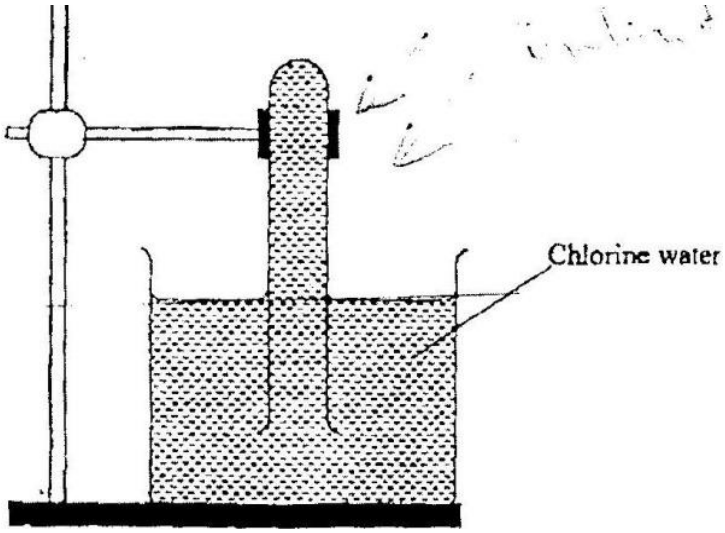


Which curve shows the variation in temperature for the pure solid? Explain. **(2mks)**

……

……

8. In an experiment, a test-tube full of chlorine water was inverted in chlorine water as shown in the diagram below and the set up left in sunlight for one day.



After one day, a gas was found to have collected in the test-tube

Identify the gas **(1mks)**

……

How can the above gas be tested? **(2mks)**

……

……

9. The table below shows some properties and electronic arrangements of common ions of elements represented by letters P to X. Study the information in the table and answer the questions that follow

Element	Ion	Electron arrangement	Atomic radius	Ionic radius
P	P^{2+}	2,8,8	0.197	0.099
Q	Q^{-}	2,8	0.072	0.136
R	R^{+}	2,8,8	0.231	0.133
S	S^{3+}	2,8	0.143	0.050
T	T^{2+}	2,8,8	0.133	0.074
U	U^{2+}	2,8	0.160	0.065
V	V^{+}	2,8	0.186	0.095
W	W^{+}	2	0.152	0.060
X	X^{-}	2,8,8	0.099	0.181

Give the atomic numbers of the elements P and Q **(2mks)**

P -

Q –

Select the most reactive metallic element **(1mk)**

……

Select 3 elements that belong to the same group of periodic table **(2mks)**

……

Select 3 elements that would react with cold water to evolve hydrogen gas **(1mk)**

……

Why is the ionic radius of element X larger than its atomic radius? **(1mk)**

……

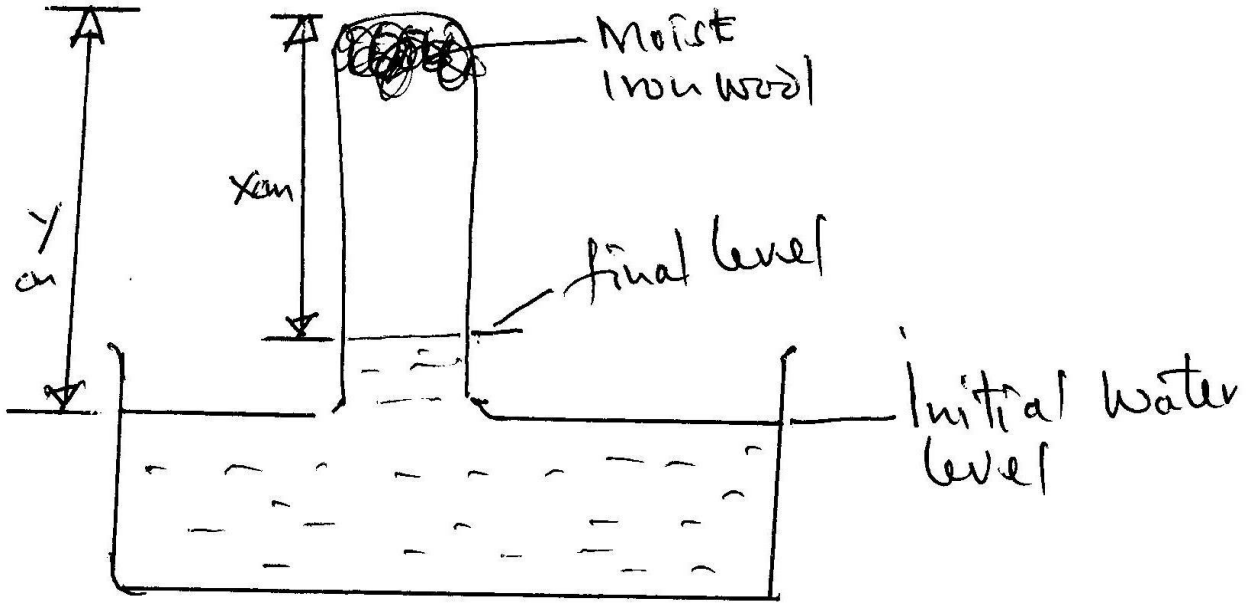
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Write an equation of the reaction between element S and Oxygen **(2mks)**

……

……

10. Moist iron wool was inverted over water. The set up was left to stand for 2 days



Explain whether rusting is a physical or chemical reaction **(2mks)**

……

……

……

Write an expression using X and Y to show the percentage of Oxygen **(2mks)**

……

……

What would be the effect of using a larger piece of iron wool? Explain. **(2mks)**

……

……

……

State two similarities between rusting and combustion **(2mks)**

……

……

11. Observe the equation below

$Fe_2O_{3(s)} + CO_{(g)} \quad Fe_{(s)} + CO_{2(g)}$

i) Balance the equation **(1mk)**

……

ii) Select the following from the above equation

Oxidizing agent **(1mk)**

Reducing agent **(1mk)**

iii) State two situations where redox reactions are applied in industry **(2mks)**

……

……

……

12. Carbon (IV) sublimes at -78^{o}C. It is called dry ice

Why is it called dry ice? **(1mk)**

……

……

It is used for keeping ice cream cold. Why is it preferred to ordinary ice? **(2mks)**

……

……

Name two other substances that behave as dry ice **(2mks)**

……

Give an industrial application of sublimation **(1mk)**

……

……

13. a) Element X has two isotopes. Two thirds of $^{33}_{16}X$ and one-third $^{30}_{16}X$. What is the relative mass of element X?

An element, A, has 30 protons and 35 neutrons. What is **(2mks)**

The mass number of element A?

The charge on the most stable ion of element A?

d) An element B consists of three isotopes of mass, 28, 29 and 30 and percentage abundances of 92.2, 4.7 and 3.1 respectively. Show that the relative atomic mass of element is 28.11 **(4mks)**

e) Elements X and Y have atomic numbers 11 and 17 respectively. Which one of the elements is a metal? Give a reason for your answer. **(2mks)**

……

……

f)The table below shows the atomic numbers of four elements W,X,Y and Z

Element	W	X	Y	Z
Atomic number	20	17	19	9

Which two elements belong to the same group? **(2mks)**

……

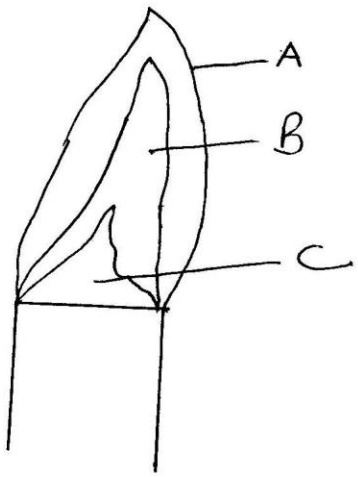
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g) Two elements M and N have atomic numbers 17 and 20 respectively. Write the formula of the compound formed when M and N react. **(1mk)**

……

……

14. The following diagram represents a non-luminous flame of the Bunsen burner



a) Name the parts of the flame labeled A, B and C **(3mks)**

……

……

……

b) Which of the parts in (a) above is the hottest? **(1mk)**

……

……

c) A non-luminous flame is preferred for heating. Explain **(2mks)**

……

……

……

d) i) Name the other type of flame produced by a Bunsen burner **(1mk)**

……

……

ii) Under what conditions does the Bunsen burner produce the flame in d(i)? **(1mk)**

……

……

e) Define the following terms as used in medicine

i) Drug **(1mk)**

……

……

ii) Prescription **(1mk)**

……

……

iii) Dosage **(1mk)**

……

……

iv) Drug abuse **(1mk)**

……

……

15. Balance the following chemical equations

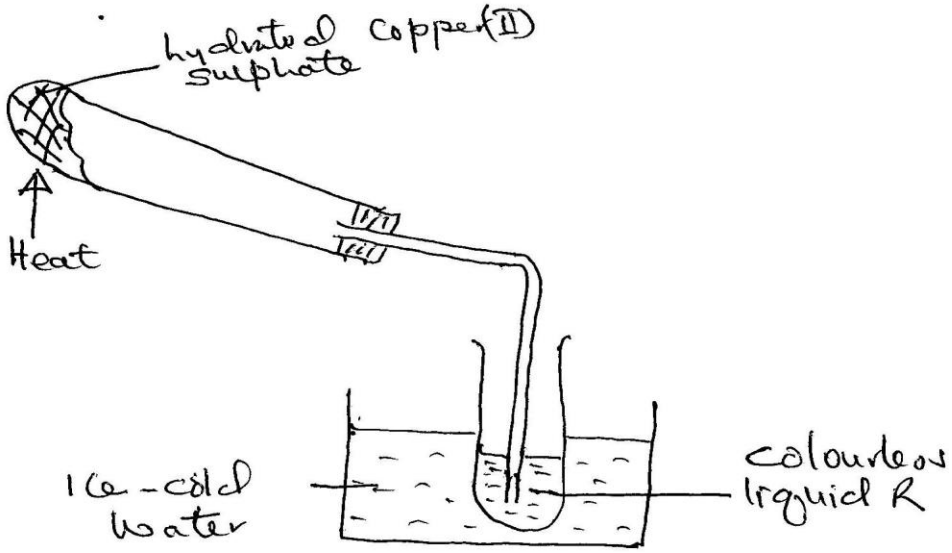
a) $Mg + O_2 \longrightarrow MgO$ **(1mk)**

b) $Mg + N_2 \longrightarrow Mg_3N_2$ **(1mk)**

c) $Al + HCl \longrightarrow AlCl_3 + H_2$ **(1mk)**

d) $C_3H_8 + O_2 \longrightarrow CO_2 + H_20$ **(1mk)**

16. Hydrated Copper (II) Sulphate is heated in a boiling tube as shown.



a) State the colour of Copper (II) Sulphate before and after heating? **(1mk)**

……

b) Explain why the boiling tube was slanted **(1mk)**

……

……

c) How can the purity of the colourless liquid be confirmed? **(1mk)**

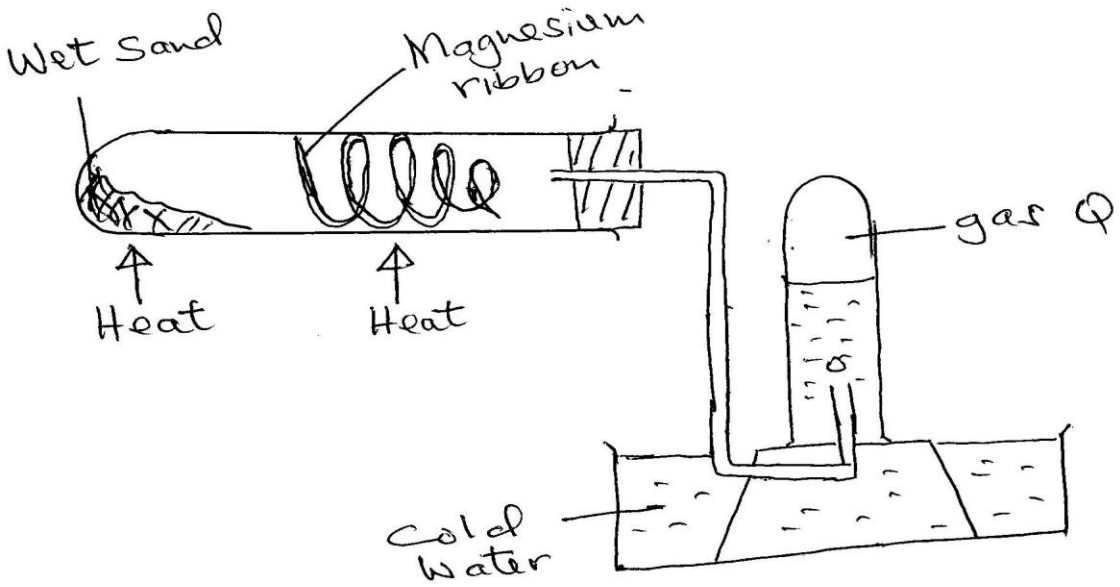
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d) Name another substance that can undergo the same change as hydrated Copper (II) Sulphate **(1mk)**

……

17. A Magnesium ribbon was cleaned with steel wool and used in the following set up. Wet sand was heated before Magnesium ribbon.



a) Explain the following:

i) Sand was heated first before heating Magnesium ribbon **(1mk)**

……

……

ii) Magnesium ribbon was cleaned with steel wool **(1mk)**

……

……

b) Name gas R **(1mk)**

……

c) Write an equation for the reaction taking place in the combustion tube **(1mk)**

……

d) Name the method used to collect gas R **(1mk)**

……

FORM 2 EXAMINATION TRIALS

CHEMISTRY

PRACTICE TEST 8

TIME: 2 HOURS

NAME…….. ADM NO…….....

SIGN……..……. DATE;……...

Answer All the questions in the spaces provided

1.a)(Describe how to light and obtain a non- luminous flame from a Bunsen burner. **(3 mks)**

……

……

……

b) State one disadvantage of the flame obtained above**.** **(1 mk)**

……

2. State the type of changes undergone by the following substance,

a) Obtaining kerosene from crude oil**.** **(1 mk)**

……

b) Souring of milk**.** **(1 mk)**

……

3. The table below shows liquids that are miscible and those that are immiscible

liquid	L3	L4
L1	Miscible	Miscible
L2	miscible	immiscible

Use the information given to answer the question that follow

1. Name the method that can be used to separate L1 and L2 from a mixture of two. **(1 mk)**

……

II) Describe how a mixture of L2 and L4 can be separated. **(2mks)**

……

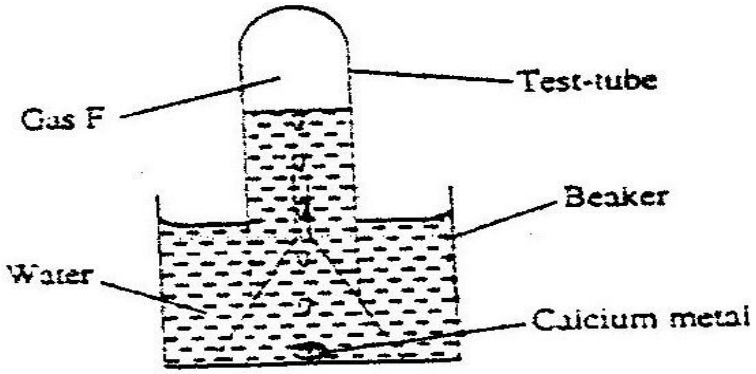
……

4. A beekeeper found that when stung by a bee application of a little solution of sodium hydroxide helped to relieve irritation from the affected area. Explain. **(2 mks)**

……

……

5. The set up below was used to collect gas F produced by the reaction between water and calcium metal



i) Name **gas F.** **(1 mk)**

……

ii) At the end of the experiment the solution in the beaker was found to be a weak base. Explain why the solution is a weak base. **(2 mks)**

……

……

……

III) Give one laboratory use of the solution formed in a beaker. **(1 mk)**

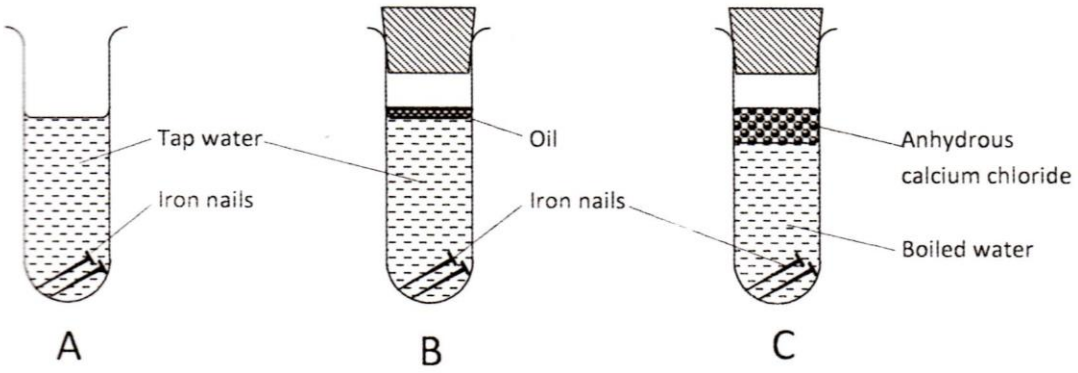
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6. Write the formula for the oxide of

A) Magnesium

b) Chlorine

7. The following set-ups were used to investigate the rusting of iron. Study it and answer the question that follow.



A) Give a reason why rusting did not occur in test **tube c.** **(1 mk)**

……

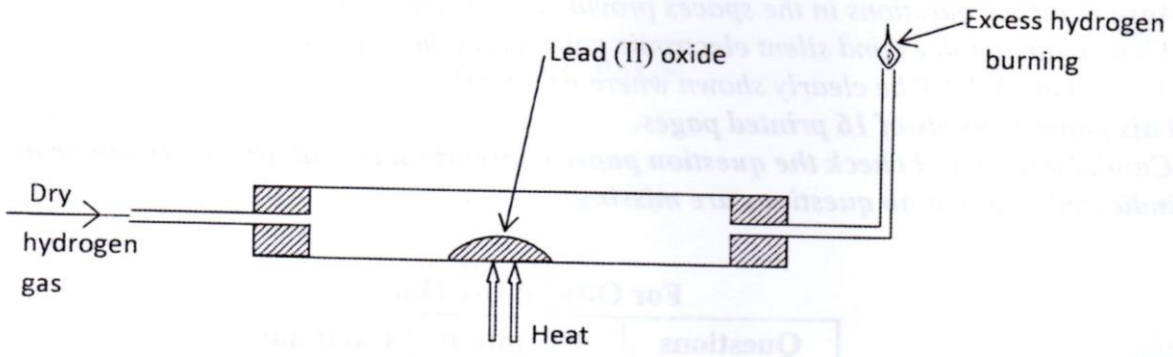
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b) Aluminum is used to protect iron sheets from rusting. Explain two ways in which aluminum protects iron from rusting**.** **(2 mks)**

……

……

8. When hydrogen gas is passed over heated lead (ii) oxide, a reaction occurs as shown in the set-up below.

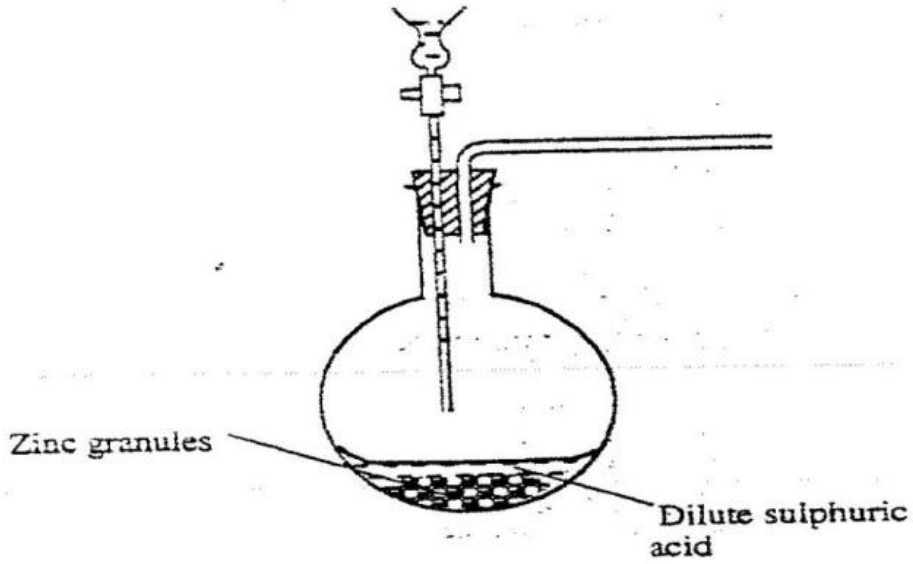


State what happens inside the combustion tube **(1 mk)**

……

……

9. The set-up below was used to prepare hydrogen gas



A) Complete the diagram to show how a dry sample of hydrogen gas can be collected**.(3 mks)**

b) Write an equation for the reaction which take place when hydrogen gas burns in air.(1 mk)

……

……

10. Both graphite and molten lead (ii) chloride conducts electricity. State the substance that conducts electricity in:

A) Graphite**.** **(1 ½ mks)**

……

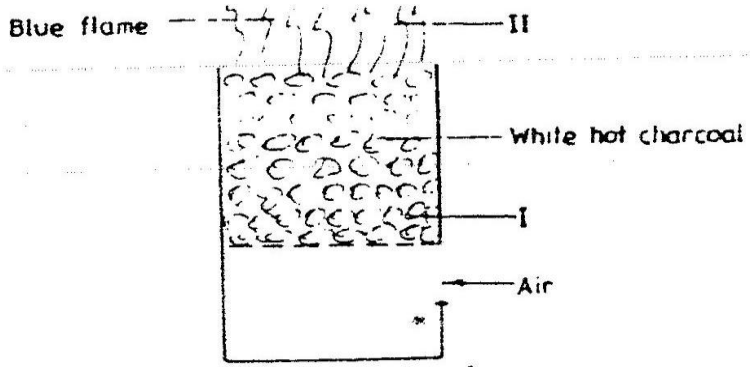
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b) Molten lead (ii) chloride**.** **(1 mk)**

……

……

11. The diagram below represents a charcoal burner. Study it and answer the question that follows



A) Write equations for the reactions taking place at **(i) and (ii) above.** **(2 mks)**

i)

ii)

b) At region marked y an oxide of carbon forms. This oxide is often referred to as a "silent killer"

i) Identify the oxide. **(1 mk)**

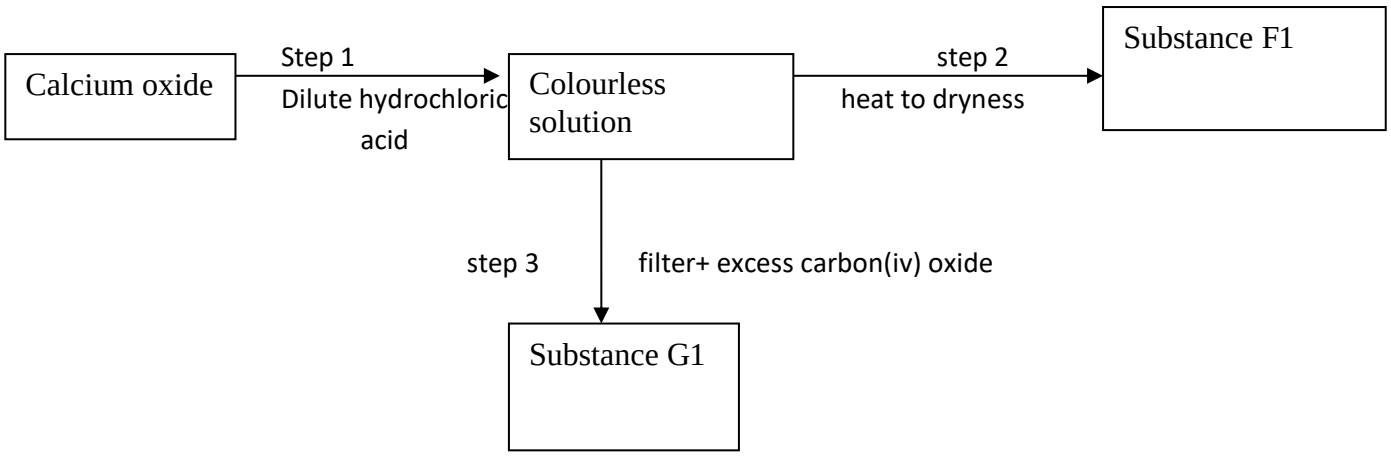
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ii) Why is this oxide described as a silent kille**r.** **(2 mks)**

……

……

12. Study the flow chart below and answer the questions that follow



A) Give the name of the process that take place in step **1.** **(1 mk)**

……

……

b) Give

i) The name of substance **G.** **(1 mk)**

……

ii) Suggest one use of carbon (iv) **oxide.** **(1 mk)**

……

……

13. The table below shows some of the elements of the periodic table and their atomic numbers, atomic masses and melting point. The letters are not the actual symbols of the elements

Element	B	C	D	E	F	G	H	I	J	K
tomic no	7	8	19	15	2	9	6	16	12	11
Atomic mass	14	16	39	31	4	19	12	32	40	23
Melting point oc	-209	-218	63	44	-272	223	VARY	113	669	98

a) Select two elements with oxidation state of -3**.** **(2 mks)**

……

……

b) Which elements represent the most powerful reducing agent**.** **(1 mk)**

……

……

c) How does the atomic radii of D compare with that of K. Explain**.** **(2 mks)**

……

……

d) How do you compare the electrical conductivity of element J and K. Give your reason**.(2 mks)**

……

……

……

e) Select two elements which when reacted with element G forms a compound that conducts electricity both in molten and aqueous state**.** **(2 mks)**

……

……

f) Select two elements that have a common valency. State the elements. **(2 mks)**

……

……

g) In which group and period do D and G belong?

(D) Group period. **(1 mk)**

(G) Group period. **(1 mk)**

h) Select one element stored in

a) Water-

b) paraffin.- **(2 mks)**

14. a) Define the term "salt**"** **(1 mk)**

……

……

b) Describe how you can prepare crystals of sodium chloride under laboratory conditions starting with $100cm^3$ of a solution of dilute hydrochloric acid**.** **(3 mks)**

……

……

……

……

c) State at least two uses of salts**.** **(2 mks)**

……

……

15. State term(s) used to describe the processes below when salts are exposed to air for some time

i) Anhydrous copper ii sulphate becomes **wet.** **(1 mk)**

……

……

ii) Fresh crystals of sodium carbonate Na_2Co_3.10H2o become powdery**.** **(1 mk)**

……

……

16. Using dots (.) and crosses(x) draw a diagram to show bonding in ammonia**.** **(2 mks)**

……

……

17. In terms of structure and bonding explain why graphite

A) Conducts electricity

……

……

……

b) Has a higher melting point**.** **(2 mks)**

……

……

……

18. a) What is a radical as used in chemistry**.** **(1 mk)**

……

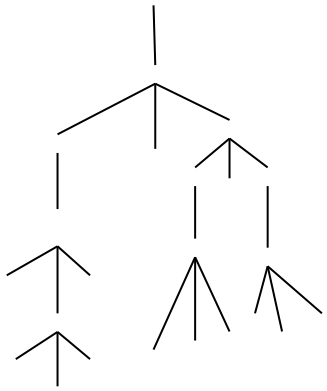
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b) State the formula of the compound formed when the following radicals combine

i) Ammonium, NH_4^+ and sulphate, $\mathbf{SO_4^{2-}}$. **(1 mk)**

ii) Calcium ion Ca^{2+} and phosphate, PO_4^{3-} ion**.** **(1 mk)**

19. Study the structure below which represents an allotrope of carbon



A) Identify the allotrope. **(1 mk)**

……

b) State one of its uses, giving reasons for your answer. **(2 mks)**

……

……

20. Ethanol,C_2H_5OH has a boiling point of 78^0c while dimethylether,$(CH_3)_2O$ has a boiling point of only $^-33^o$c, yet dimethyl either has a higher molecular mass than ethanol. Explain the observation in terms of structure and bonding**.** **(2 mks)**

……

……

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21. The table below gives information about element in period three of the periodic table

element	Atomic no	Atomic radius	Ionization energy
Sodium	11	0.002nm	50kj
Magnesium	12	0.001nm	70kj
Aluminum	13	0.0005nm	93kj
Silicon	14	0.0001nm	107kj

a) State and explain the changes in atomic radius across the period. **(2 mks)**

……

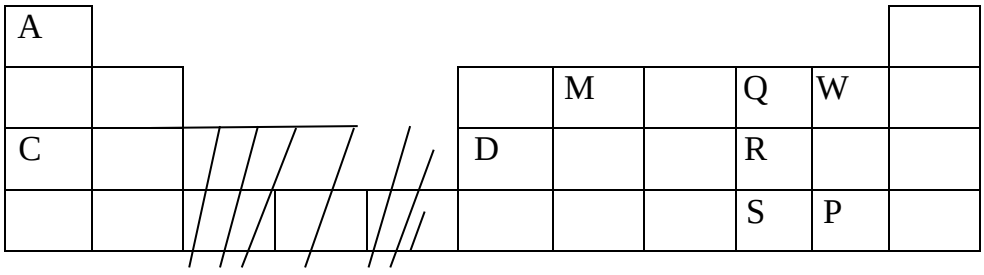
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b) Give reason(s) for increases ionization energy across the perio**d.** **(2 mks)**

……

……

22. The grid below represents parts of the periodic table. Study it and answer the questions that follow letter do not represent actual symbols of elements-draw the grid



i) Select two element with a charge of -2**.** **(2 mks)**

……

……

ii) Which is the most reactive non metal above**.** **(1 mk)**

……

……

iii) Give the formula of the oxide of D**.** **(1 mk)**

……

……

iv) Show on the grid an element which is mono atomic**.** **(1 mk)**

……

……

v) On the grid provided assign and indicate the position of iron metal**.** **(1 mk)**

……

……

vi) Compare the atomic radii of element d and r. **Explain.** **(2 mks)**

……

……

vii) Element m forms 2 isotopes whose isotopic composition is as given below

$^{12}_{6}M$(75%) and $^{14}_{6}m$(25%). Calculate its relative atomic mass**.** **(3 mks)**

……

……

……

……

……

23. Name a property of neon that makes it suitable for use in electric **lamps.** **(1 mk)**

……

……

24. Four metals F,G,H and J were each separately added to cold water and steam. Metal F and H reacted with cold water and very explosively with steam Metals G and J showed no reaction with cold water.

A) Suggest the identify of metal H**.** **(1 mk)**

……

……

b) Write an equation for the reaction between metal F and steam**.** **(1 mk)**

……

……

c) Metal J forms a hydroxide whose formula is $J(OH)_2$

Suggest the chemical family of metal**.** **(1 mk)**

……

……

d) Suggest a metal above which forms a monovalent ion**.** **(1 mk)**

……

……

FORM 2 EXAMINATION TRIALS

CHEMISTRY

PRACTICE TEST 9

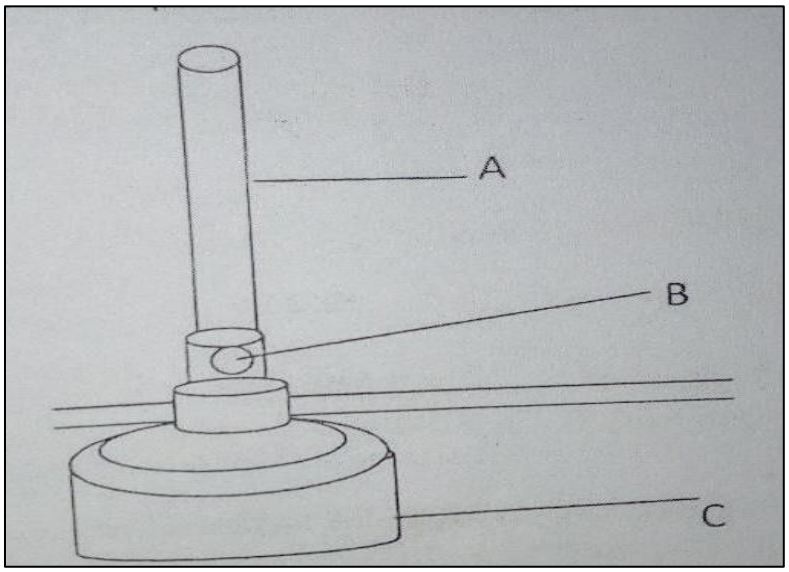
TIME: 2 HOURS

NAME…….. ADM NO…….....

SIGN……..……. DATE;……...

Answer All the questions in the spaces provided

1. The diagram below shows parts of the Bunsen burner.



(a) Name the parts **labelled** **(1 mark).**

A

B

(b) Give one use of the part labelled **B** **(1 mark).**

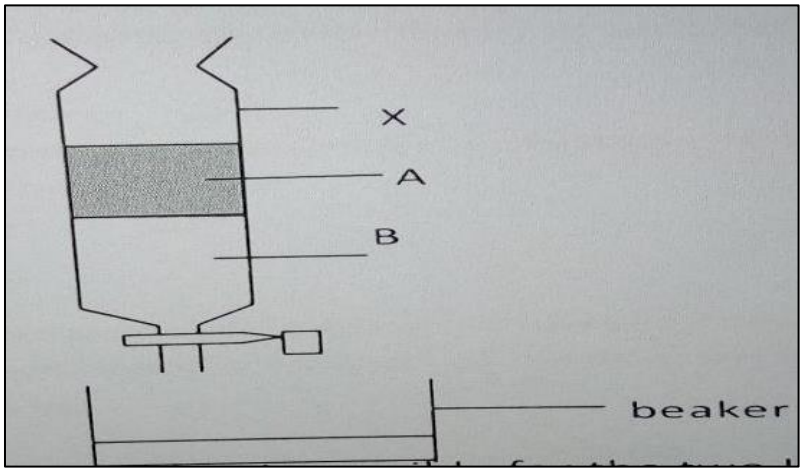
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2. Name two apparatus that are used to measure exact volumes **(2 marks).**

……

……

3. The diagram below represents a method of separation used to separate two liquids , A and B,



Use it to answer the questions that follow.

(a) Name the method of separation shown above **(1 mark).**

……

(b) Name two properties that makes it possible for the two liquids to be separated **(2 marks).**

……

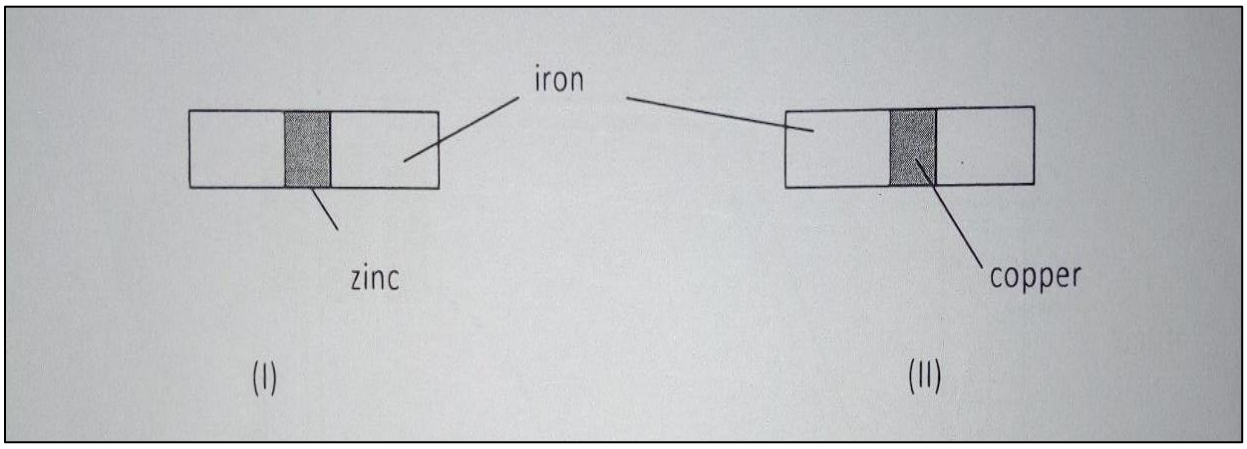
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(c) Give one alternative method that may be used to separate the two liquids **(1 mark).**

……

……

4. In an experiment, two pieces of iron sheet were wrapped in each case with zinc and copper metal sheets as shown below. They were left in the open for some months.



(a) State and explain the observations made in the experiment I and **II** **(3 marks).**

I

II

5. Given zinc oxide, dilute nitric (v) acid and sodium carbonate solution. Briefly describe how you can prepare zinc carbonate **(3 marks).**

……

……

……

6. State two solids that may be heated to obtain oxygen gas as the only gas **(2 marks).**

……

7. Study the information given below and answer the questions that follow.

Formula of the compound.	NaCl	$MgCl_2$	Al_2Cl_6	$SiCl_4$	PCl_3	SCl_2
B.P (^{o} C)	1470	1420	sublimes	60	75	60
M.P(^{0}C)	800	710	At 800^0 C	-70	90	-80

(a) Give two chlorides that are liquid at room temperature. Give a reason for the answer **(2 marks)**

……

……

(b) Which two chlorides would remain in liquid state for the highest temperature range. Explain **(2 marks).**

……

……

……

(c) State one use of NaCl **(1 mark).**

……

8. Copper (II) oxide reacts with zinc metal as shown below.

$CuO_{(s)} + Zn_{(s)} \longrightarrow Cu_{(s)} + ZnO_{(s)}$

Identify the substance that has been:

(i) **Reduced** **(1 mark)**

(ii) Oxidised **(1 mark)**

9. An element B burns in air to form an oxide of B which dissolve in water to form a solution that turns blue litmus paper red. (B is not the actual symbol of the element).

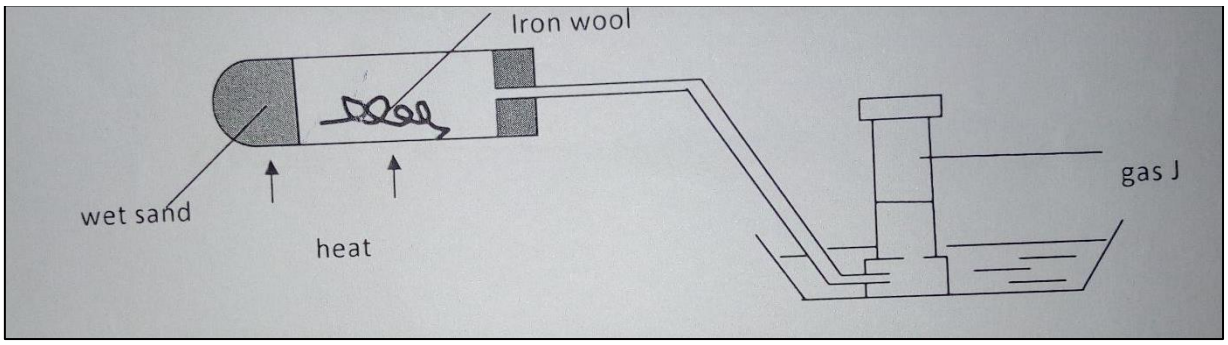
Is B a metal or a non-metal? Give a reason for your answer **(2 marks).**

……

……

……

10. Study the diagram below and answer the questions that follow.



(a) Name gas **J** **(1 mark).**

……

(b) Explain why it is important to heat the wet sand before heating the iron wool **(1 mark).**

……

……

(c) State one observation made in the combustion tube as heating is carried out **(1 mark).**

……

……

11. State two differences between permanent and temporary changes **(2 marks).**

Permanent.	Temporary.

12. The table below give some properties of substances I, J and K. Study it and answer the questions that follow.

Substance.	Melting point (^{0} c)	Solubility in Water.	Electrical Conductivity in:	
			Solid state.	Molten state.
I	1063	Insoluble	Conducts.	Conducts.
J	113	Insoluble	Doesn't	Doesn't
K	402	Sparingly soluble.	Doesn't	Conducts and it is decomposed.

(a) Suggest the type of structure in:

I **(1 mark).**

K **(1 mark).**

(b) Explain why molten K is decomposed by current but I is not decomposed **(1 mark).**

……

……

13. Solution R,S and T have pH values shown in the table below.

Solution	pH
R	1.0
S	6.5
T	8.0

(a) What do you deduce about the nature of solution R**?** **(1 mark).**

……

(b) Identify two solutions that will react to form a neutral **solution** **(1 mark).**

……

14. State and explain the changes in mass that occur when zinc metal is heated in an open crucible **(2 marks).**

……

……

……

15. The pH of the soil sample was found to be 6.0. An agricultural officer recommended the addition of lime(calcium oxide). State two functions of lime in the soil **(2 marks).**

……

……

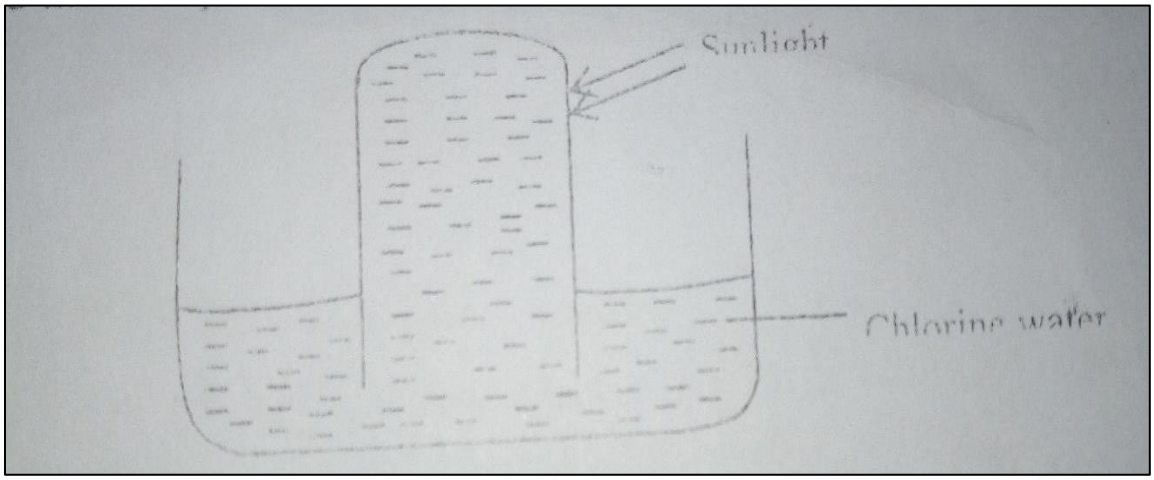
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16. (a) Using a dot(.) and cross(x) to represent the outer most electrons, draw diagrams to show the bonding in magnesium sulphide **(2 marks).** (Mg=12,S=16).

(b) State the structure of the above compound **(1 mark).**

(c) Give two properties of substances with the above **structure** **(2 marks).**

17. In an experiment a test tube full of chlorine water was inverted in chlorine water as shown in the diagram and the set up left in the sunlight for one day.



After one day a gas was found to have collected in the test tube.

(a) Identify the **gas** **(1 mark).**

(b) State the observations made when a blue litmus paper is dipped in chlorine water **(1 mark).**

18. The elements shown in the table below (not actual symbols) belong to a certain family of metals in the periodic table. Study the information and answer the questions that follow.

Element.	Atomic size (nm).
S	0.160
T	0.180
V	0.930

(i) Define the term ionization energy **(1 mark).**

……

……

(ii) Which element is likely to have the highest ionization energy. Explain **(2 marks).**

……

……

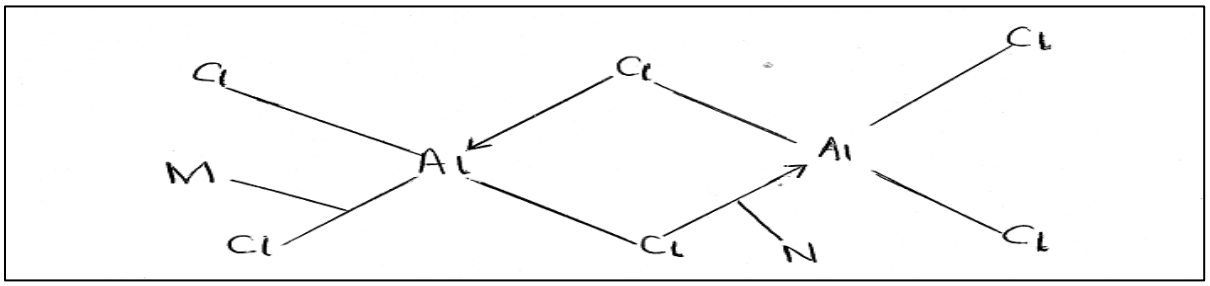
……

19. State two applications of solvent extraction **(2 marks).**

……

……

20. The diagram below represents the structure of aluminum chloride.



(a) Identify the bonds labeled M and N **(2 marks).**

M

N

(b) What is the difference between bonds M and N (1 mark).

……

……

21. From the following list of compound; Zinc oxide, Potassium carbonate, solid carbon (Iv) oxide, nitric acid, iron(III)chloride, sodium chloride.

(i) Identify two substances that sublime **(1 mark).**

……

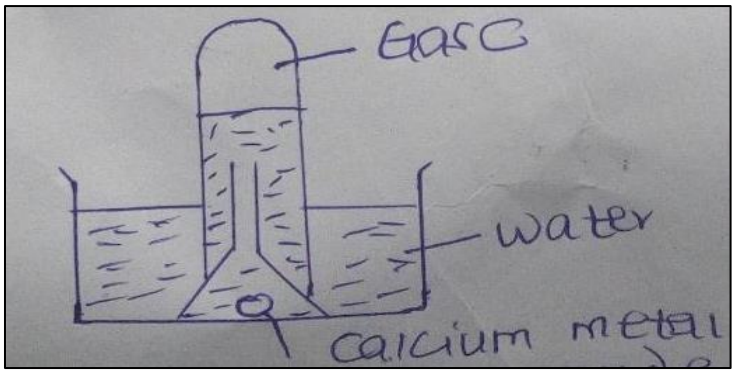
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(ii) Identify two substances that react to form salt and water only **(1 mark).**

……

……

22. The figure below is a set up used to investigate the reaction of calcium with water.



(a) State the observation made in the water **(1 mark).**

……

……

(b) Identify gas **C** **(1 marks).**

……

……

(c) State one laboratory application of the solution formed in the reaction **(1 mark).**

……

……

23.(i) State two types of salts **(1 mark).**

……

……

(ii) Name the following processes;

(a) When anhydrous calcium chloride is left in an open beaker overnight a solution was formed **(1 mark).**

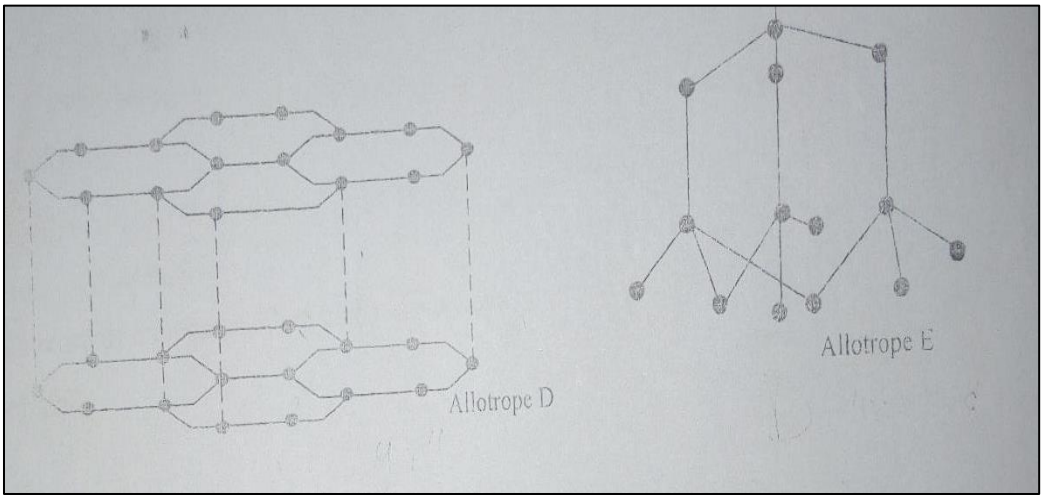
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(b) When sodium carbonate decahydrate crystals are left in an open beaker for some days it turned into a powder **(1 mark).**

……

……

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



(a) Name the allotrope D and E(2 marks).

D

E

(b) Which allotrope does not conduct electricity? Explain **(2 marks).**

……

……

25. Iron(III)chloride can be prepared in the laboratory by passing dry chlorine gas over hot steel wool.

(a) Name the above method of preparing salts **(1 mark).**

……

(b) Why should we prepare the salt in a dry environment? **(1 mark)**

……

(c) A solution of iron(III)chloride in water changes a blue litmus paper to red. Explain **(1 mark).**

……

……

26. Metal S removes oxygen combined with P. Q reacts with an oxide of R but not with an oxide of P. P reacts with cold water but Q does not.

(a) Which is the most reactive metal? **(1 mark).**

……

(b) Which is the least reactive metal? **(1 mark).**

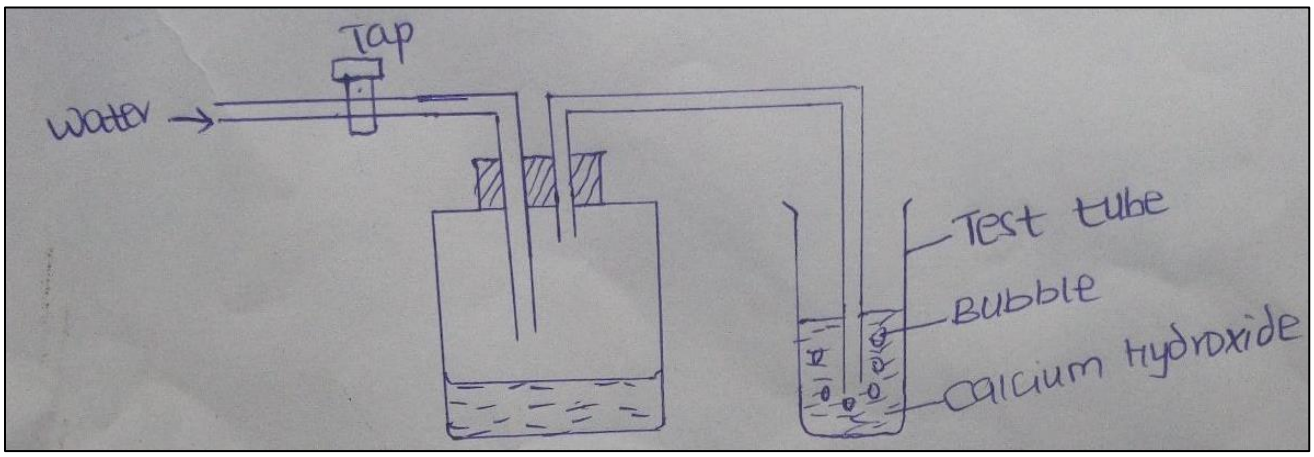
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(c) Arrange the metals in order of reactivity starting with the most reactive to the least reactive **(1 mark).**

……

……

27. The figure represents a set up of apparatus that was used to demonstrate the existence of a component of air.



(i) What is the purpose of water from the tap**?** **(1mark)**

……

……

(ii) Other than bubbles, give one other observation made in the test tube **(1 mark)**

……

……

(iii) Name a gas that was not absorbed by the calcium hydroxide. **(1mk)**

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

A								A	
							F		
	C							E	K
	D			B				H	

(a) Element A fits in two groups. Explain **(2 marks).**

……

……

(b) i) Name two elements that can form ions with a charge of -1.Explain your answer **(2 marks).**

……

……

ii) What type of structure would the oxide of B have? **(1 mark).**

……

……

(c) How does the reactivity of H compare with that of E? Explain**.** **(2 marks)**

……

……

……

(d) What name is given to the group of elements to which C and D belong? **(1 mark).**

……

……

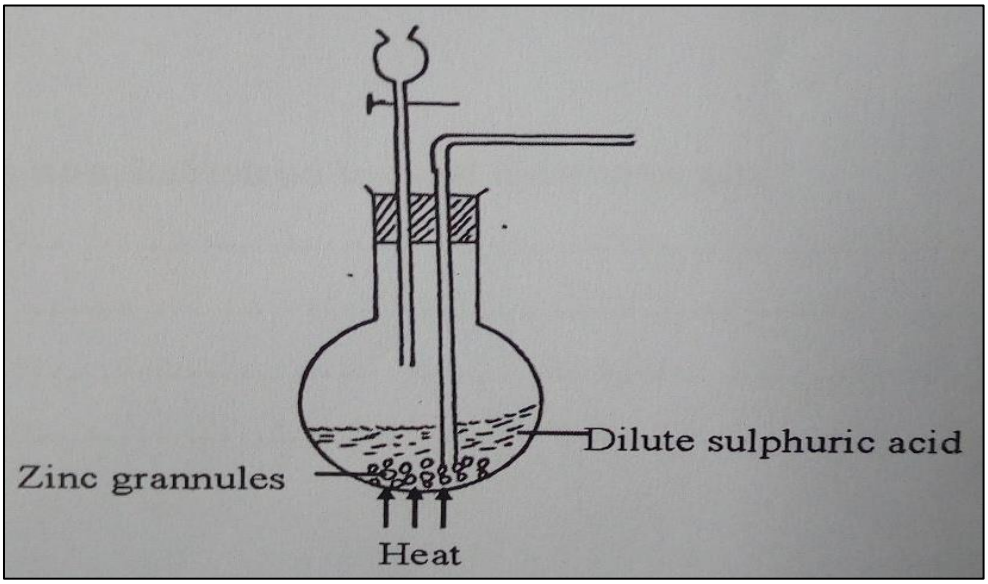
(e) Write the formula of the compound formed when elements C and F react **(1 mark).**

……

……

(f) Draw dot (.) and cross (x) diagram to represent the compound formed in (e) above **(2 marks).**

29. A student set up the arrangement below to prepare and collect dry hydrogen gas.



(a) State the catalyst that is used in preparation of hydrogen gas **(1 mark).**

……

(b) Identify two errors from the section of the arrangement shown above **(2 marks).**

……

……

(c) Complete the diagram to show how dry hydrogen gas can be collected **(2 marks).**

(d) Explain the effect of hydrogen gas on a wet red litmus paper **(1 mark).**

……

……

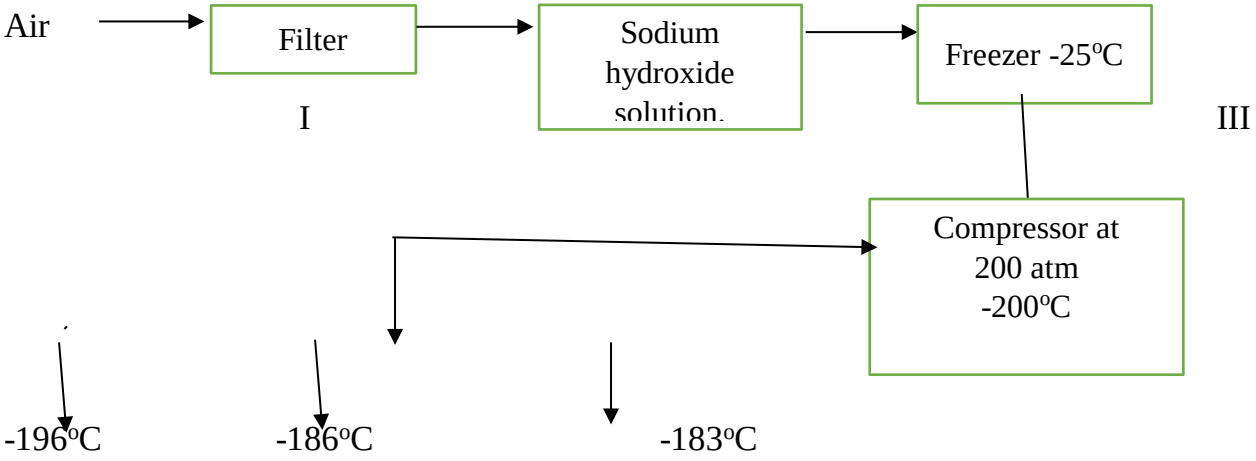
(e) Write a balanced chemical equation for the reaction that takes place when hydrogen gas is burnt in air. **(1 mark).**

……

(f) State one property of hydrogen gas that makes it to be used in balloons **(1 mark).**

……

30. Study the flow chart below and answer the questions that follow.



(a) Name the substances removed in steps **I,II and III** **(3 marks).**

I

II

III

(b) Name the gases obtained with respect to their boiling points **(3 marks).**

-196^{0}C

-186^{0}C

-183^{O}C

FORM 2 EXAMINATION TRIALS

CHEMISTRY

PRACTICE TEST 10

TIME: 2 HOURS

NAME…….. ADM NO…….....

SIGN……..……. DATE;……...

Answer All the questions in the spaces provided

1. The electron arrangement of ions X^{3+} and Y^{2-} are 2.8 and 2.8.8 respectively.

Write the electron arrangement of elements X and Y.

X - **(1 mk)**

Y - **(1 mk)**

Write the formula of the compound that would be formed between element X and Y. **(1 mk)**

2. Study the equation below;

$Mg_{(s)} + ZnO_{(s)} \longrightarrow MgO_{(s)} + Zn_{(s)}$

By use of arrows, indicate oxidation and reduction reactions in the equation. **(2 mks)**

Name the reducing agent in the above reaction. **(1 mk)**

3. Distinguish between the terms deliquescent and efflorescent salts. **(2 mks)**

……

……

……

4. The table below shows PH value of different solutions.

Solution	A	B	C	D
PH	14	7	2	11

Which solution is likely to be sugar solution? **(1 mk)**

……

Two of the solutions were found to react with both aluminium oxide and zinc oxide. Identify the two giving reasons. **(2 mks)**

……

……

……

5. Identify the methods that are most appropriate to obtain. **(3 mks)**

Oil from coconut

……

Diesel from crude oil

……

Sugar crystals from sugar solution

……

6. An element Q has an electron arrangement of 2.8.5 (a) Identify the group and period to which it belongs.

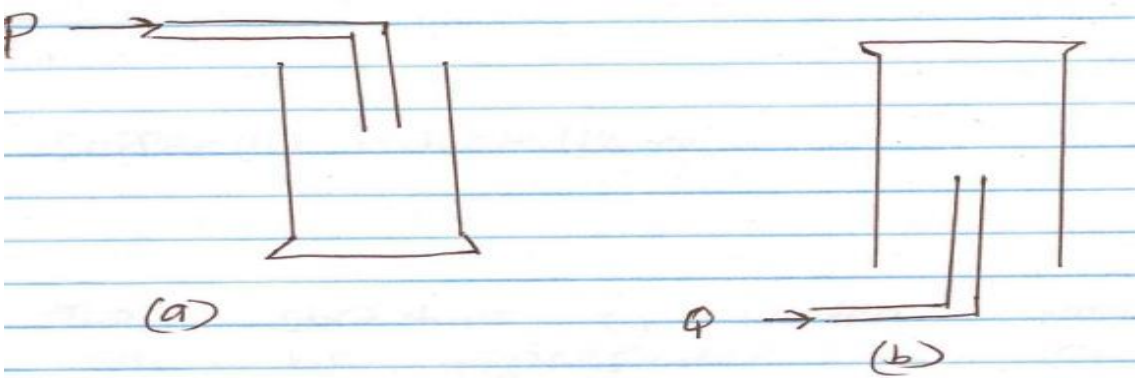
Group - **(1 mk)**

Period - **(1 mk)**

(b) is element Q a metal or a non-metal? **(1 mk)**

7. Carbon has two isotopes namely $^{14}_{6}C$ *and* $^{12}_{6}C$. Calculate the relative abundance of these two isotopes if the relative atomic mass of carbon is 12.4. **(3 mks)**

8. The diagram below shows how two gases, P and Q were collected.



3. Name the two methods shown above.

a - **(1 mk)**

b - **(1 mk)**

4. State the property of Q that enables it to be collected as shown above. **(1 mk)**

……

5. Give an example of a gas that is collected using the method shown in (b) above. **(1 mk)**

……

9. State and explain the changes in mass that occur when the following substances are separately heated in open crucibles.

Copper metal **(1 ½ mk)**

……

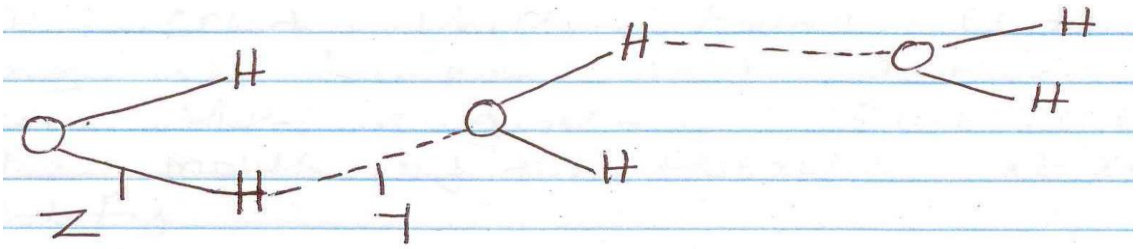
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Copper (ii) Nitrate **(1 ½ mks)**

……

……

10. The structure of water molecule can be represented as shown below.



(a) Name the type of bonds represented by letters Y and Z.

Y – **(1 mk)**

Z - **(1 mk)**

11. Element R has a valency of 2, element Q has a valency of 1 while element B has a valency of 3. Write the chemical formulae of their sulphates, phosphates and nitrates. **(4½ mks)**

Element	Sulphates	Phosphates	Nitrates
R			
B			
Q			

12. When a white solid X is heated, a yellow solid which turns white on cooling is formed and a brown gas is seen. When a glowing splint is placed at the mouth of the test-tube it relights.

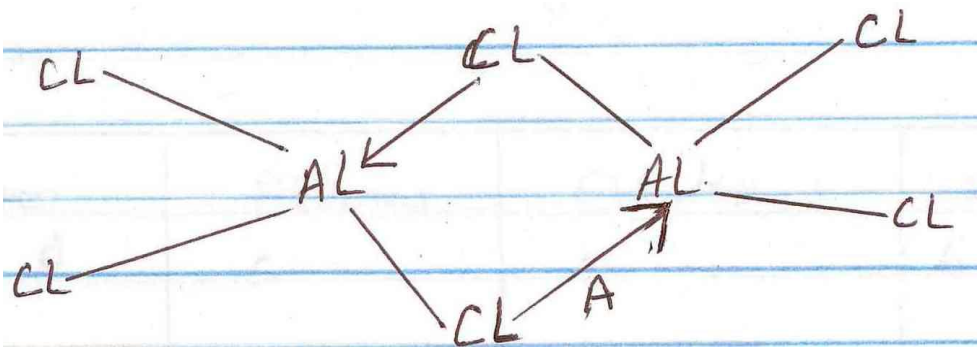
a) Identify;

Solid X - **(1 mk)**

The brown gas - **(1 mk)**

b) Write an equation for the decomposition of solid X. **(1 mk)**

13. Below is a structure of aluminium chloride.



Identify bond A. **(1 mk)**

……

State the observations made when aluminium chloride solution is tested with blue and red litmus paper. Explain. **(2 mks)**

……

……

……

14. Which particles conduct electricity in;

Molten lead (ii) bromide **(1 mk)**

……

Aqueous sodium chloride **(1 mk)**

……

Graphite **(1 mk)**

……

15. The following table gives the structures of the different atoms. Study it and answer the questions that follow. (A, B, C, D and E do not represent the actual symbols of the elements).

Atom	Protons	Electrons	Neutrons
A	5	5	6
B	9	9	10
C	10	10	11
D	15	15	16
E	10	10	12

i) What is the mass number of atom B? **(1 mk)**

……

……

ii) Which of the atoms has a mass number of 11? **(1 mk)**

……

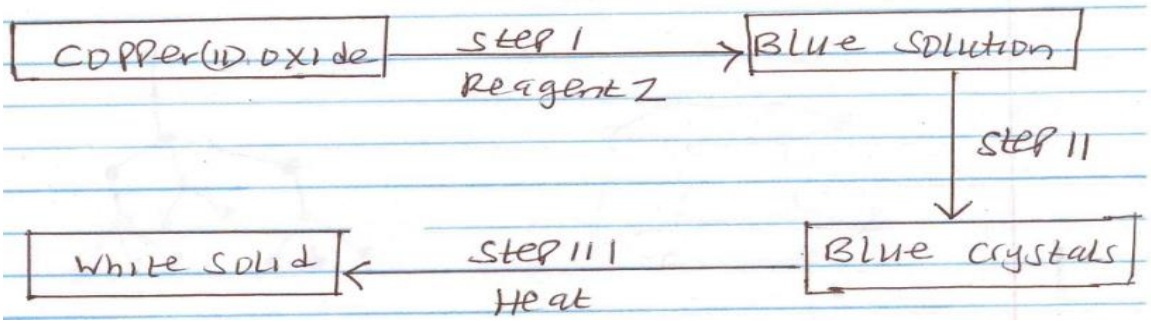
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iii) Which of the atoms represent isotopes of the same element. **(1 mk)**

……

……

16. Study the following flow chart and answer the questions that follow.



(a) (i) Identify reagent Z. **(1 mk)**

……

(ii) Identify the white solid. **(1 mk)**

……

(b) Write a chemical equation for the formation of the blue solution. **(1 mk)**

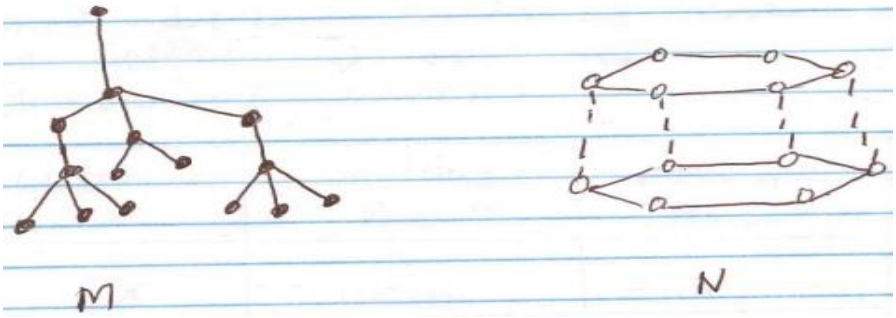
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17. State two properties that makes aluminium to be used in making of overhead electric cables. **(2 mks)**

……

……

18. The structures below represent two allotropes of carbon. Study them and answer the questions that follow



Identify the allotropes labeled

M - **(1/2 mks)**

N - **(1/2 mks)**

Explain in terms of structure and Bonding which of the two allotropes;

Conducts electricity. **(1 mk)**

……

……

Is used in making drilling equipments. **(1 mk)**

……

……

19. (a) Name two conditions which accelerate rusting. **(2 mks)**

……

……

……

(b) State ONE method used for preventing rusting. **(1 mk)**

……

……

20. The information below gives melting points of some substances. The letters do not represent the actual symbols of elements.

Substance	Melting point ^{0}C	Boiling point ^{0}C
X	1536	3100
Y	65	1115
Z	-40	361
P	-218	-190
Q	99	890
R	116	445

a) Identify any two substances that are solids at room temperature (25^0C). **(2 mks)**

……

……

b) Identify a substance that is a liquid at room temperature. **(1 mk)**

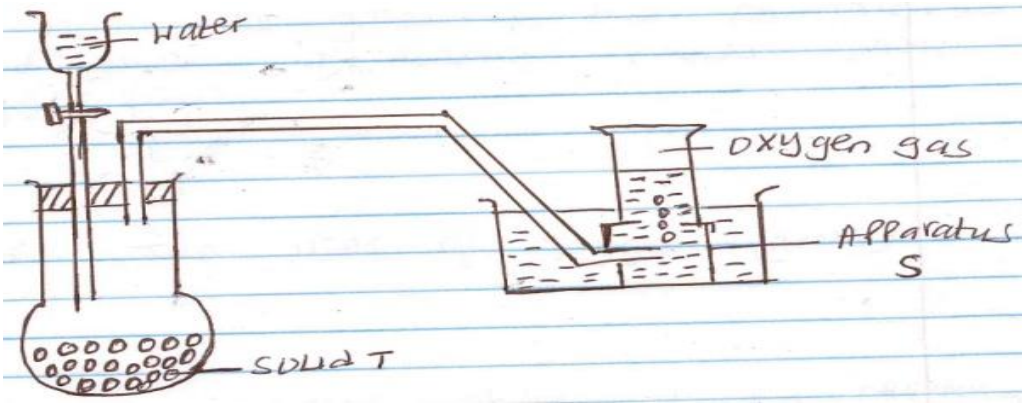
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c) Identify a substance that remains as a liquid over the widest range of temperature. **(1 mk)**

……

……

21. (a) The following diagram shows how oxygen can be prepared and collected in the laboratory.



Name;

I apparatus S - **(1 mk)**

II solid T - **(1 mk)**

Why is it possible to collect oxygen as shown in the diagram? **(1 mk)**

Explain why it is important NOT to collect any gas for the first few seconds of the experiment? **(1 mk)**

……

……

Write an equation for the reaction that takes place. **(1 mk)**

……

……

(b) What name is given to the compounds formed when an element reacts with oxygen? **(1 mk)**

……

……

(c) State TWO uses of oxygen. **(2 mks)**

……

……

22. Name the salts obtained by reacting;

Zinc oxide with dilute sulphuric (vi) acid. **(1 mk)**

……

Sodium carbonate with nitric acid. **(1 mk)**

……

Potassium carbonate and dilute hydrochloric acid. **(1 mk)**

……

23. (a) The table below shows properties of some substances.

Substance	Melting point (^{0}C)	Boiling point (^{0}C)	Electrical conductivity	
			Solid	Liquid
A	-112	-107	Poor	Poor
B	801	1413	Poor	Good
C	97.5	880	Good	Good
D	44	280	Poor	Poor
E	1700	2200	Poor	Poor
F	-110	46.3	Poor	Poor

Select a substance which;

Has a giant ionic structure. **(1 mk)**

Is a metal **(1 mk)**

Has a giant atomic structure. **(1 mk)**

(b) Using dots(.) and crosses (x) illustrate bonding in ammonia molecule (NH_3)**. (N=7, H=1) (2 mks)**

24. When a student was stung by a nettle plant, a teacher applied an aqueous solution of ammonia to the affected area of the skin and the student was relieved of the pain. Explain. **(1 mk)**

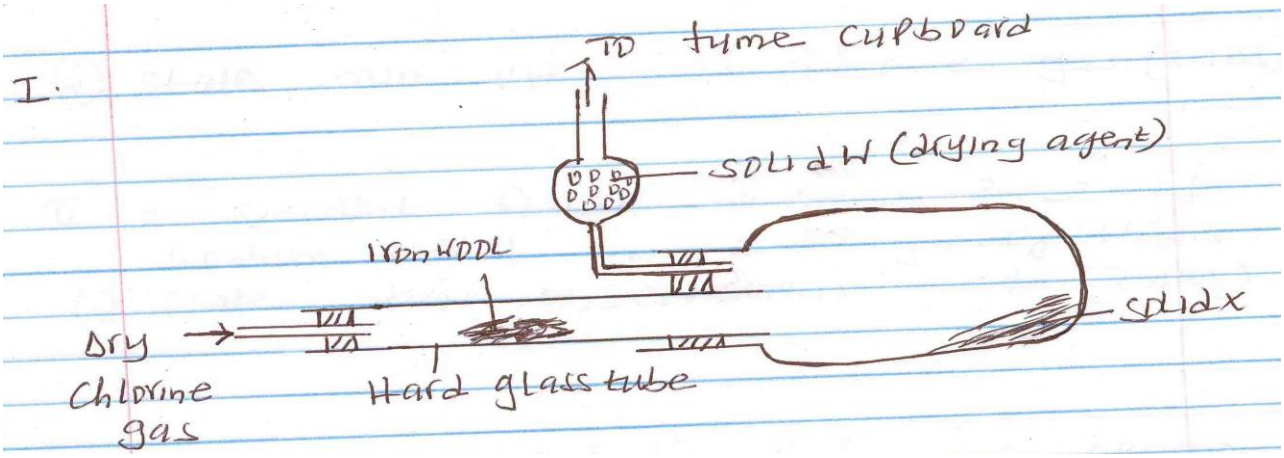
25. (a) The information below is on four elements represented by letters P, Q, R and S. study it and answer the questions that follow. Q reacts with dilute acids but not with acids. S displaces P from its oxide and P reacts with cold water. Arrange the elements inorder of increasing reactivity. **(1½ mks)**

(b) State ONE reason why Helium is preferred to hydrogen in weather balloons. **(1 mk)**

……

……

26. The set up below shows the reaction between dry chlorine gas and iron wool.



(a) Give one essential condition that is missing in the set up. **(1 mk)**

……

(b) Why is it not advisable to release excess chlorine gas in the atmosphere? **(1 mk)**

……

……

(c) Write a chemical equation for the formation of solid X. **(1 mk)**

……

……

(d) Name solid W and state why it is necessary. **(2 mks)**

……

……

……

(e) Give the formula of the product formed if iodine vapour is reacted with heated iron wool. **(1 mk)**

……

……

(f) State two uses of chlorine gas. **(2 mks)**

……

……

……

(ii) A student placed a small piece of sodium metal in a trough of water.

State two observations made? **(2 mks)**

……

……

……

Write a chemical equation for the reaction that took place. **(1 mk)**

……

……

27. The products formed by action of heat on nitrates of elements A, B and C are shown below.

Nitrates	Products formed
A	Metal oxide + Nitrogen(iv)oxide + Oxygen
B	Metal + Oxygen + Nitrogen(iv)oxide
C	Metal nitrite + Oxygen

(a) Arrange the metals in order of increasing reactivity. **(1 mk)**

……

(b) Which element forms a soluble carbonate? **(1 mk)**

……

……

(c) Give an example of element B. **(1 mk)**

……

……

d) (i) Write an equation to show the effect of heat on each of the following;

Sodium hydrogen carbonate. **(1 mk)**

……

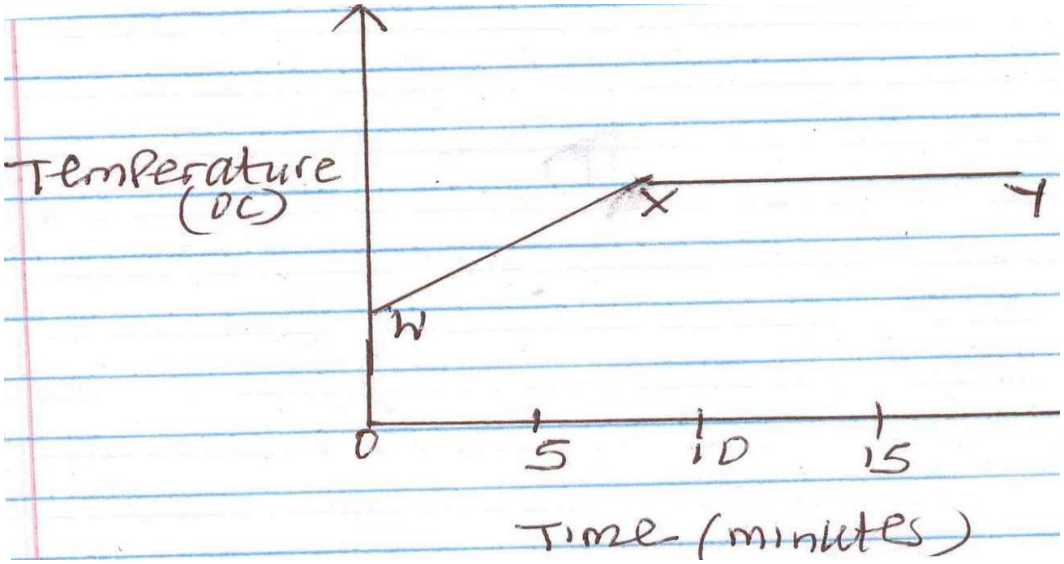
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Copper(ii)carbonate **(1 mk)**

……

……

28. The graph below shows the curve obtained when water at 20^0C was heated for 15 minutes.



a) What happens to water molecules between point W and X? **(1 mk)**

……

……

b) In which part of the curve does change of state occur? **(1 mk)**

……

……

c) Explain why the temperature does not rise between point X and Y. **(1 mk)**

……

……

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