1. The table below indicates the pH values of solutions labeled A,B,C,D and E.

Solution	A	B	C	D	E
pH value	5	13	2	10	7

Identify the solution i) Containing the highest concentration of hydrogen ions.

.....

.....

ii) Which solution is likely to be acetic acid? Give a reason.

.....

.....

iii) Which is likely to be common salt solution.

.....

.....

2. In an experiment an equal amount of iron fillings and sulphur powder was heated in a test tube. The mixture was left to cool then dilute hydrochloric acid added to it.

a) State the observations that were made:

i) If dilute hydrochloric acid was added to the mixture in the test tube before heating

.....

ii) Dilute hydrochloric acid was added to mixture after cooling.

.....

b) Write an equation for the reaction which occurred in a) (ii) above.

.....

3. An organic compound K reacts with fluorine to form a compound with formula

$CH_3CHFCHFCH_3$

a) Draw the structural formula of K.

b) To which homologous series does K belong.

.....

.....

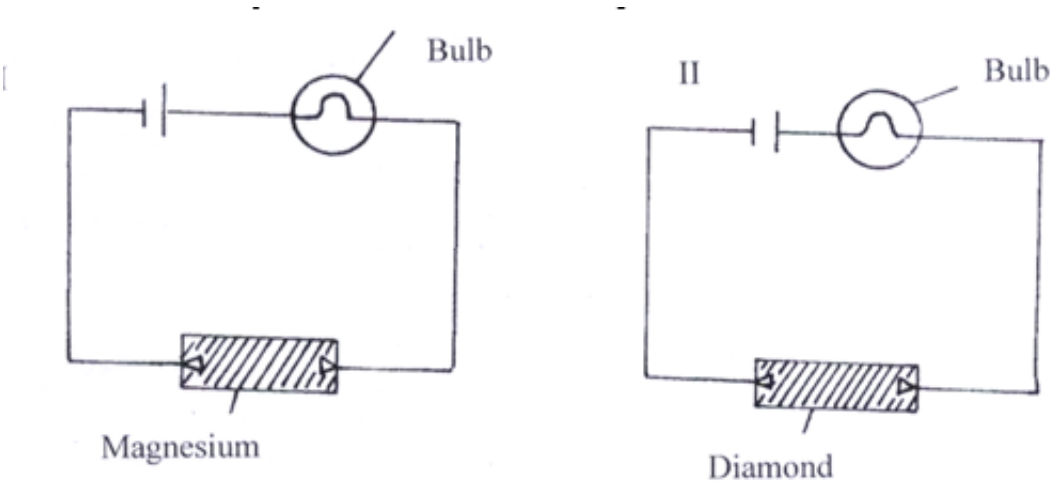
c) Give the I.U.P.A.C. name of the product above.

.....

.....

4. The following set-ups were used by form two students to investigate electrical conductivities of two

substances. Study and use it to answer the question that follow.



Explain the difference in observation made in set-ups I and II above.

.....

.....

5. a) What is meant by double decomposition?

.....

b) Starting with 1M sodium sulphate solution, describe how you would prepare dry lead (II) sulphate

.....

.....

6. A reference book states that the solubility of copper (II) sulphate in water at

75^0C is 19g/100g of water.

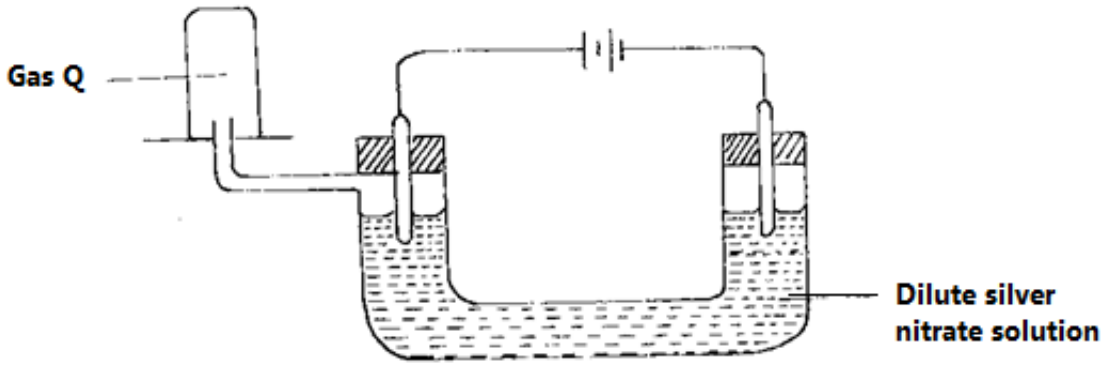
a) What is meant by the term 'solubility'

.....

.....

b) The solubility of copper (II) sulphate at 75^0C is 55g/100g of water. What mass of crystals of copper (II) sulphate would be deposited if 52.2g of CuSO4 solution at 75^0C is allowed to cool to 15^0C.

7. Use the set-up below answer the questions that follow.



a) Give the equation for the reaction taking place at cathode.

.....

.....

b) What is the identity of gas Q?

.....

.....

8. State and explain the observation made when burning magnesium is lowered into a gas jar containing sulphur (IV) oxide gas.

.....

.....

9. A student carried out some experiment on action of sulphuric (VI) acid on three carbonates and recorded her results as shown in the table below. Study the table and answer the question that follows. The carbonates used were of the same mass and concentration.

Carbonate	Acid	Vol. of CO_2 obtained
$CaCO_3$	H_2SO_4	$8cm^3$
$MgCO_3$	H_2SO_4	$100cm^3$
$ZnCO_3$	H_2SO_4	$100cm^3$

Explain the results in terms of Volume of CO2 gas obtained.

.....

.....

10. Hydrogen gas reacts with ethene to form ethane. Calculate the volume of hydrogen required convert 14g of ethane to ethane at S.T.P.

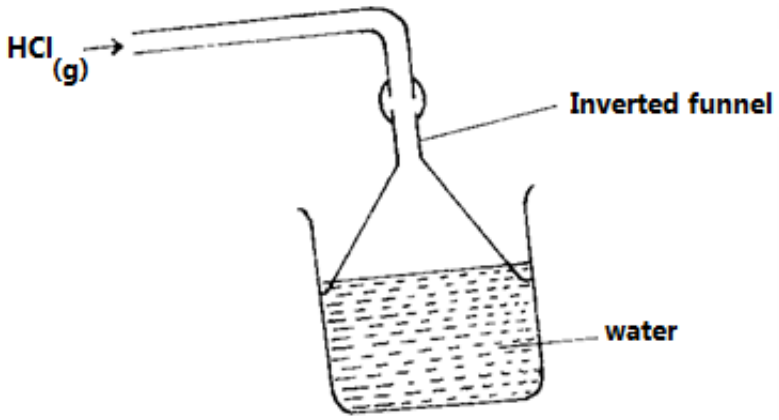
$$C_2H_{2(g)} + H_{2(g)} \rightarrow C_2H_6$$

(C=12,H=1, molar gas volume at S.T.P is 22.4 litres)

.....

.....

11. An aqueous solution of hydrogen chloride can be prepared as shown in the diagram below.



a) Give two reasons for using an inverted funnel.

.....

.....

b) Few drops of silver nitrate solution were added to 4cm3 of the solution obtained above, followed by excess aqueous ammonia. Explain the observation made.

.....

.....

12. Magnesium reacts with nitrogen to form a white solid known as magnesium nitride.

i) Write the chemical equation for the reaction taking place.

.....

.....

ii) Briefly outline a chemical test that can be used to distinguish magnesium nitride from magnesium oxide.

.....

.....

13. When hydrogen gas was passed over heated lead (II) oxide in a combustion tube and the gaseous product cooled, a colourless liquid was obtained.

a) i) Name the colourless liquid.

.....

ii) Which chemical test would you use to confirm the colourless liquid above?

.....

.....

b) What observation can be made in the combustion tube?

.....

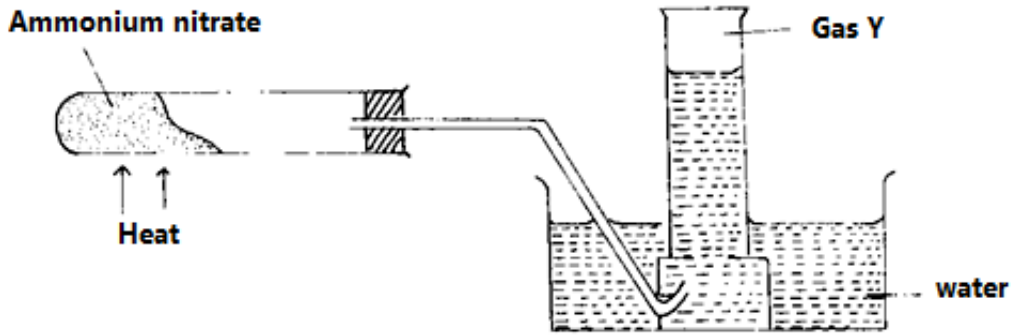
.....

c) Write an equation for the reaction between hydrogen and the lead (II) oxide.

.....

.....

14. The set up shown below was used to prepare gas Y. Study it and answer the questions that follow.
Ammonium nitrate



a) Identify gas Y.

.....

.....

b) Give the confirmatory test for gas Y.

.....

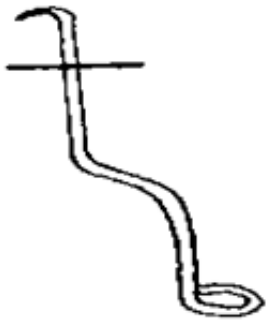
.....

c) State one use of gas Y.

.....

.....

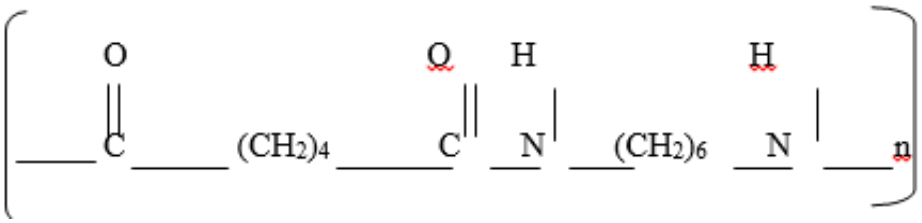
15. The apparatus shown below is commonly used in a chemistry laboratory. Give its name and state one use.



Name.....

Use.....

16. a) Nylon 66 is a condensation polymer whose structure is as follows.



Draw the structures of the two monomers from which nylon 6,6 is obtained.

i) .....

.....

ii) .....

.....

b) Give one economic importance of Perspex.

.....

17. a) Using dots $(\bullet)$ and crosses (x) to represent electrons, draw diagrams to represent.

i) NH_3 (N=7, H=1)

ii) NH_4^+

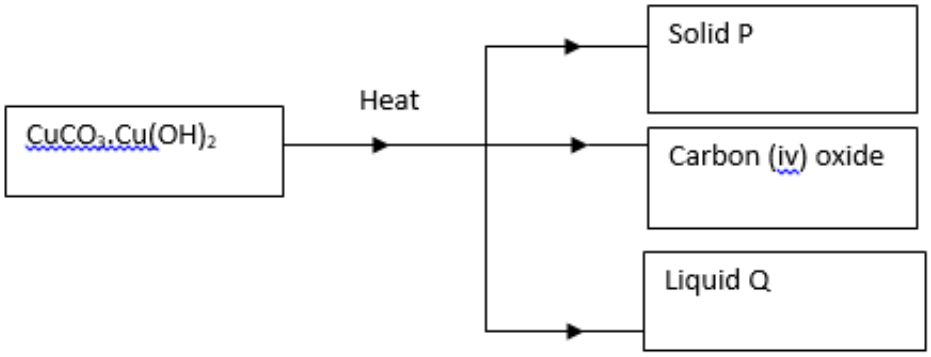
b) State why ammonia molecule NH3 can combine with H^+ to form NH_4^+

.....

.....

18. The flow chart below shows thermal decomposition of a basic carbonate (CuCO3.Cu(OH)2).

Study it and answer questions that follow.



a) Identify solid P.

.....

.....

b) Write an equation for the reaction that lead to formation of liquid Q.

.....

.....

19. Describe how a sample of a mixture of potassium chloride and lead (II) chloride can be separated into solid samples.

.....

.....

20. A hydrocarbon has 92.31% carbon and 7.69% hydrogen. Its relative molecular mass is 78.

i) Determine the molecular formula of the hydrocarbon. (C=12, H=1)

.....

.....

ii) Draw its structure.

21. Phosphorous (v) chloride fumes in air. Explain this observation using chemical equations.

.....

.....

22. Sodium carbonate is manufactured in large scale in Kenya by Solvay process.

a) Carbon (iv) oxide is one of the ingredients required in this process. State its source.

.....

.....

b) One of the products is calcium chloride which can be used as a source of calcium metal. Briefly explain how calcium can be obtained from the calcium chloride.

.....

.....

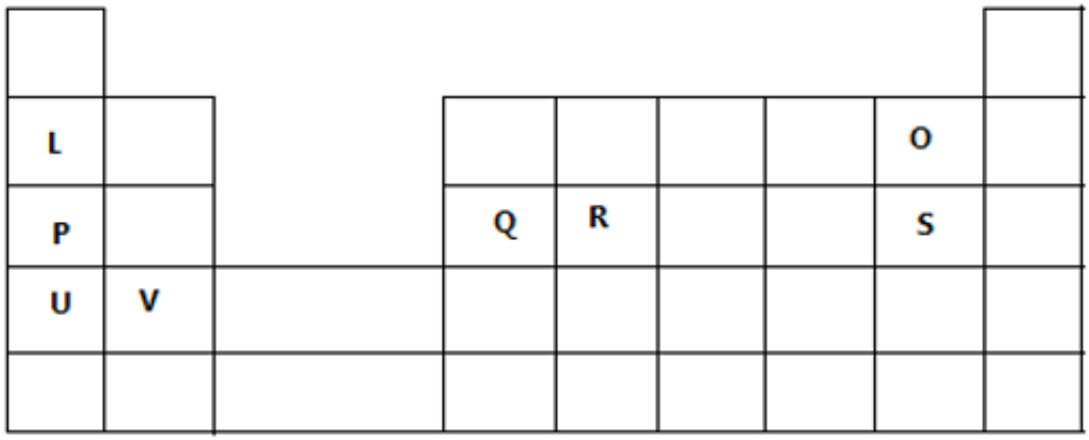
23. 30cm3 of 0.5HCl was used to neutralize 25cm3 of sodium hydroxide solution.

Determine the concentration of sodium hydroxide in grams per litre. (Na=23,H=1,O=16)

.....

.....

24. The grid below represents part of the periodic table. Study it and answer the questions that follow.



Q.....

S.....

b) Compare the melting points of P and U. Explain.

.....

.....

c) Select the most reactive non-metal. Give a reason for your answer.

.....

.....

25. a) State Graham's law of diffusion.

.....

.....

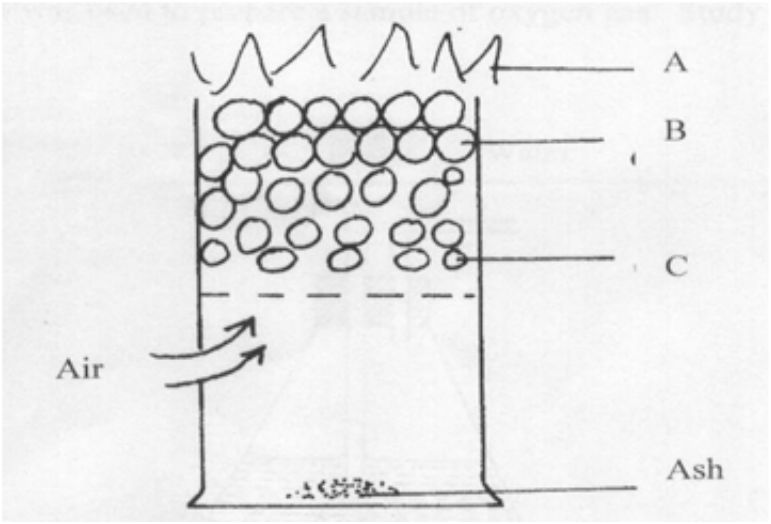
b) The rate of diffusion of two gases X and Y is 2:1 respectively. If the mass of gas Y is 16g,

Calculate the relative molecular mass of gas X.

.....

.....

26. The diagram below represents a charcoal jiko burning.



a) Write the equations for the reactions that occur in regions A and B.

A.....

.....

B.....

.....

b) Explain why it is not advisable to leave a burning jiko overnight in your sleeping room with no ventilation.

.....

.....

27. a) What is rust?

.....

.....

b) Name two conditions for rusting to occur.

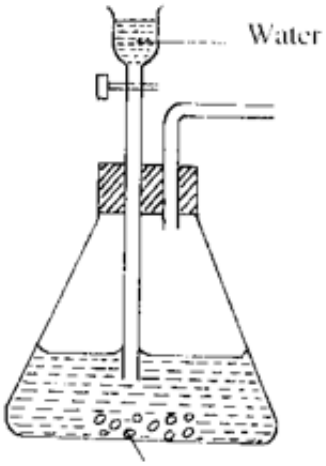
.....

.....

c) How does aluminium paint prevent rusting?

.....

28. The set-up below was used to prepare a sample of oxygen gas. Study it answer questions below.



Solid A

a) Complete the above diagram to show how oxygen is collected.

b) Identify solid A.

.....

.....

29. A luminous flame produces more light than a non-luminous flame. Explain.

.....

.....