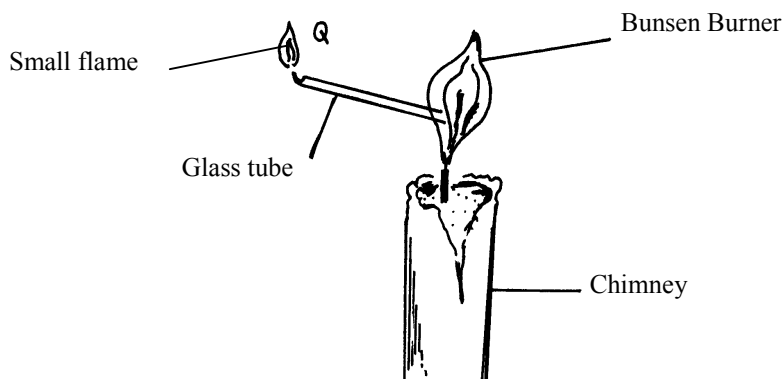


## SAMPLE PAPER 8

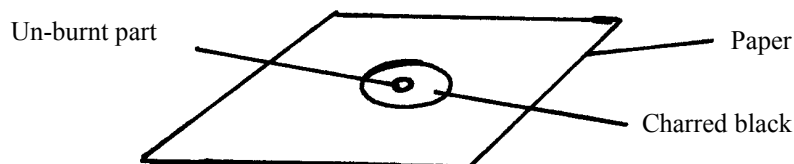
### PAPER 1

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- Starting with a named metal and a named acid, describe with the aid of a diagram how hydrogen gas is prepared in the laboratory and collected over water. (2 marks)
- A student accidentally mixed anhydrous sodium carbonate and ammonium carbonate in the laboratory.
  - Suggest an appropriate method that can be used to separate the salts. (1 mark)
  - State one application of the method named in (a) above. (1 mark)
- A glass tube was inserted into a flame formed when the air hole of the Bunsen burner was fully open as illustrated below:-



- When a burning splint was brought near point Q, a small flame lit at this end of glass tube. Explain. (1 mark)
- The figure below shows a paper that was placed horizontally across the middle of the above flame and quickly withdrawn. Explain the observation. (1 mark)

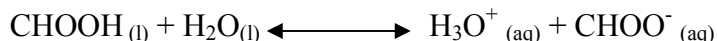


- 2.7g of  $\text{Pb}(\text{NO}_3)_2$  was heated strongly in a crucible until there was no further change.
  - Write a balanced chemical equation for the reaction which took place. (1 mark)

(ii) Calculate the mass of the residue. (2 marks)

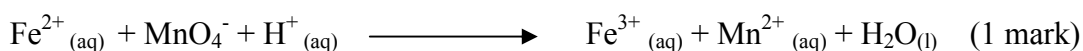
(Pb = 207, N=14, O=16)

5. Methanoic acid is hydrolysed by water in the reaction represent by the equation below:-



Identify the acid in the forward reaction. Give a reason for your answer. (2 marks)

6. a) Balance the ionic equation below.



b) Using oxidation numbers, show the species that is reduced (1 mark)

7. Study the table below and answer the questions that follows:-

Substance	Melting Point ( $^{\circ}$ C)	Boiling Point ( $^{\circ}$ C)	Electric conductivity		Solubility
			Solid	Liquid	
X	37	344	Poor	Poor	Insoluble
Y	-114	-85	Poor	Poor	Good
K	1610	2230	Poor	Poor	Insoluble
L	29	685	Good	Good	Good
M	614	1382	Poor	Good	Good

Select the substance from the given data which:-

(i) Has a giant ionic structure (1 mark)

(ii) Has a giant covalent structure (1 mark)

(iii) Is a gas at room temperature (1 mark)

8. The Molar mass of a gaseous compound  $\text{XO}_2$  is  $64\text{gMol}^{-1}$ . A sample of this gas occupied  $11.2\text{dm}^3$  at S.t.p. Find:-

(i) The number of moles of this gas. (1 mark)

(ii) The amount in grams that occupied the above volume. (1 mark)

9. 1.44g of magnesium ribbon when strongly heated in dry nitrogen gas, 2.0g of magnesium nitride was formed.

a) Determine the simplest formula of magnesium nitride. (Mg = 24, N = 14) (2 marks)

b) Write a chemical equation between Magnesium and nitrogen (1 mark)

10. The structures shown below represent two cleansing agents A and B.



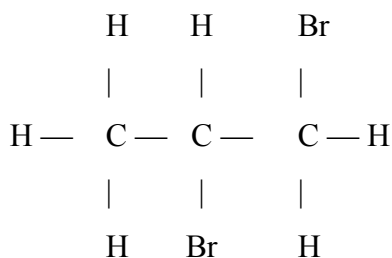
(i) Which cleansing agent would be more suitable for washing in water containing magnesium sulphate. (1 mark)

(ii) Explain your answer in (i) above. (1 mark)

(iii) State one disadvantage of using B over A. (1 mark)

11. Sulphur is extracted from underground deposits by frash process. State two physical properties of Sulphur that makes it possible to be extracted through this process. (2 marks)

12. Bromine reacted with compound Q to form a compound with structural formula.



(i) Write the structural formula of Q (1 mark)

(ii) When Q is reacted with concentrated Sulphuric (vi) acid compound P is formed which further reacted with water to form K.

I. Identify substance K. (1 mark)

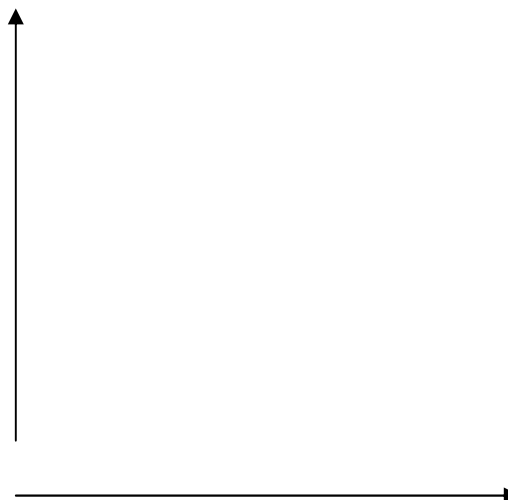
II. Write an equation to show how compound K reacts with sodium metal. (1 mark)

.....  
 .....

13. The table below gives three experimental results on the reaction of excess Sulphuric (vi) acid and 1.0g of Zinc done under different conditions. In each case, the mass of the contents in the vessel was recorded at different time intervals.

Experiment	Nature of Zinc	Concentration of H <sub>2</sub> SO <sub>4</sub>
I	Granules	1.0 M
II	Powder	2.0 M
III	Powder	1.0 M

On the axis below, draw and label the three curves that could be obtained from such results.



(2 marks)

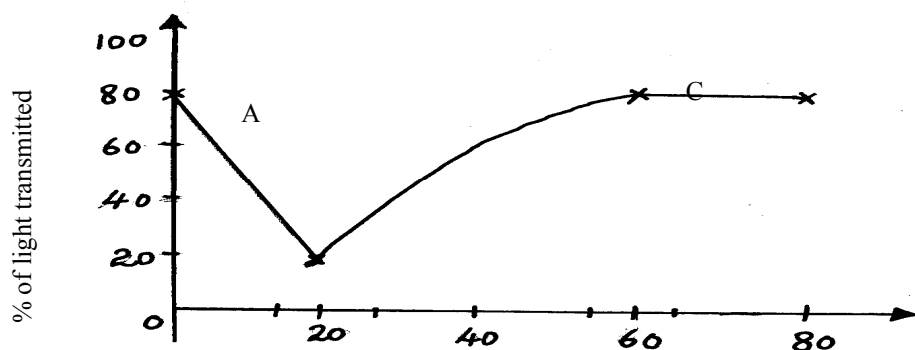
14. a) Explain why calcium Oxide is not used to dry hydrogen chloride gas. Support with an equation.

(2 marks)

b) Name a suitable drying agent for hydrogen chloride gas.

(1 mark)

15. A certain volume of lead (ii) nitrate solution was put in a conical flask and titrated with Sodium hydroxide solution. The mixture was stirred continuously to ensure thorough mixing of the reagents. The percentage of light transmitted by the mixture was measured on a suitable instrument and plotted against volume of the Sodium hydroxide used.



Volume of  $\text{NaOH}_{(\text{aq})}$

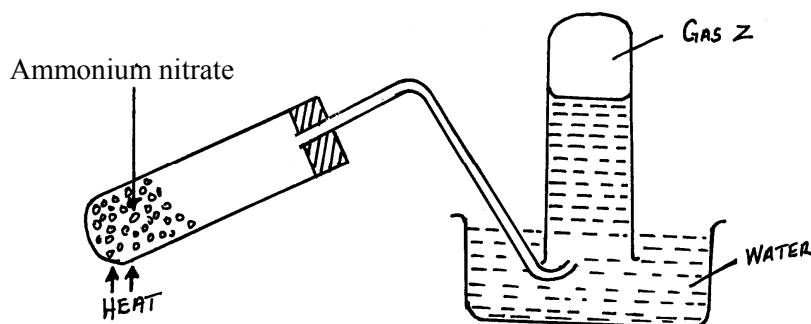
With the aid of the relevant Chemical equations explain the following observation:-

(i) The percentage of light transmitted fell in section AB. (1 ½ marks)

(ii) The percentage of light transmitted rose sharply along section BC. (1 ½ marks)

16. Explain why iodine is a bad conductor of heat and electricity. (2 marks)

17. Study the diagram below and answer the questions that follows:-



a) Name gas Z. (1 mark)

b) Write an equation for the reaction taking place in the test tube. (1 mark)

c) State one property of gas Z. (1 mark)

18. Metal R and S were used to form a cell. The following half – equations show the standard electrode potential for the half-cells. (R and S are not the actual symbols of the elements)

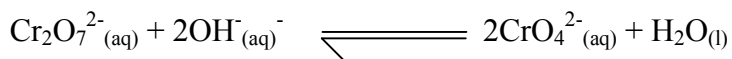


a) Identify the readily reduced species (1 mark)

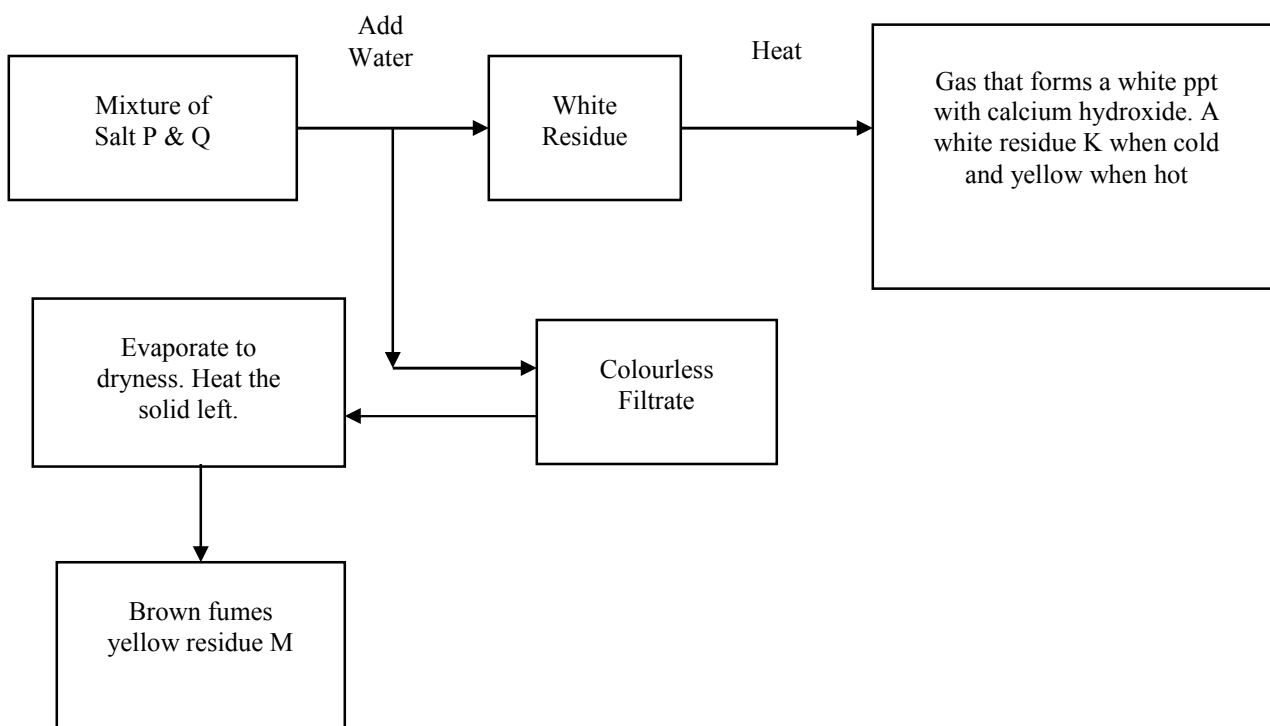
b) Calculate the e.m.f. of the cell (1 mark)

c) Write the convectional cell representation of the cell. (1 mark)

19. A dynamic equilibrium between dichromate and chromate ions is established as shown in the equation below:-



- a) What is meant by a dynamic equilibrium? (1 mark)
- b) State and explain the observation that would be made if a few pellets of potassium hydroxide are added to the equilibrium? (2 marks)
20. Study the chart below that shows the separation of two compounds and use it to answer the questions that follows.



- a) Identify the cations present in K and M. (2 marks)
- b) Name any one possible anion present in the mixture. (1 mark)
21. 8.0g of a mixture of potassium Chloride and Sodium nitrate were dissolved in water and the resultant solution treated with excess Silver nitrate solution. 11.40g of pure Silver Chloride was precipitated. Determine the percentage by mass of Sodium nitrate in the mixture. (3 marks)  
(K=39, Cl=35.5, Ag=108)
22. Differentiate between the bleaching action of chlorine and Sulphur (iv) Oxide gas. (2 marks)
23. An aqueous potassium Sulphate Solution was electrolyzed using Platinum electrodes in a cell.
- a) Name the product formed at the cathode and anode (1 mark)
- Anode:
- Cathode:

- b) How does the concentration of the electrolyte change during electrolysis? (1 mark)
- c) Write the equation for the reaction that takes place at the anode. (1 mark)

24. Study the table below and answer the questions that follow.

Element	Reaction with oxygen	Reaction with water
J	Formed acidic oxide	No reaction
K	Formed basic acidic	Formed soluble hydroxide plus hydrogen gas
L	Formed acidic oxide	Dissolve to form acidic solution

From the table, identify the following:-

- (i) Non-metallic element (1 mark)
- (ii) Metallic element. (1 mark)
- (iii) Elements insoluble in water (1 mark)
25. 40cm<sup>3</sup> of carbon (iv) oxide was burnt in excess air. What is the volume of carbon (iv) oxide produced at room temperature and pressure. (3 marks)

26. Use the information given below to answer the questions that follow:-

$$\Delta H^{\circ}_c (\text{Graphite}) = - 396\text{KJmol}^{-1}$$

$$\Delta H^{\circ}_c (\text{hydrogen}) = - 288\text{KJmol}^{-1}$$

$$\Delta H^{\circ}_c (\text{C}_4\text{H}_{10}) = - 2877\text{KJmol}^{-1}$$

- a) Write the equation for the formation of (C<sub>4</sub>H<sub>10</sub>) from its elements. (1 mark)
- b) Draw an energy level diagram for the formation of butane (C<sub>4</sub>H<sub>10</sub>) and hence determine its heat of formation. (2 marks)

27. The results of an experiment to determine the solution of potassium Chlorate in water at 40<sup>0</sup>c were as follows:-

$$\text{Mass of dish} = 16.96\text{g}$$

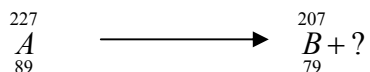
$$\text{Mass of dish + saturated solution at } 40^{\circ}\text{c} = 26.95\text{g}$$

Mass of dish + solid potassium Chlorate

$$\text{After evaporation to dryness} = 17.96\text{g}$$

Determine the solubility of potassium chlorate using the above data. (3 marks)

28. a) Complete the following equation of a nuclear reaction. (1 mark)



b) State two applications of radioactivity in medicine. (1 mark)

29. State one major ore used in the extraction of iron metal and give its formula. (2 marks)

30. Using excess Zinc powder and dilute sulphuric acid, describe how a dry sample of Zinc Sulphate crystals can be prepared. (3 marks)

31. Classify the following processes as chemical changes or physical changes. (2 marks)

Process	Physical or Chemical
a) Sublimation	
.....	
b) Displacement	
.....	
c) Neutralization	
.....	
d) Fractional distillation	
.....	