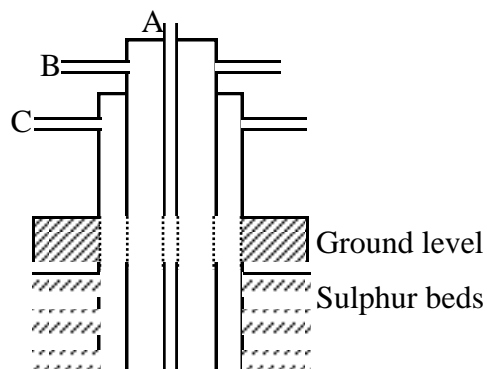


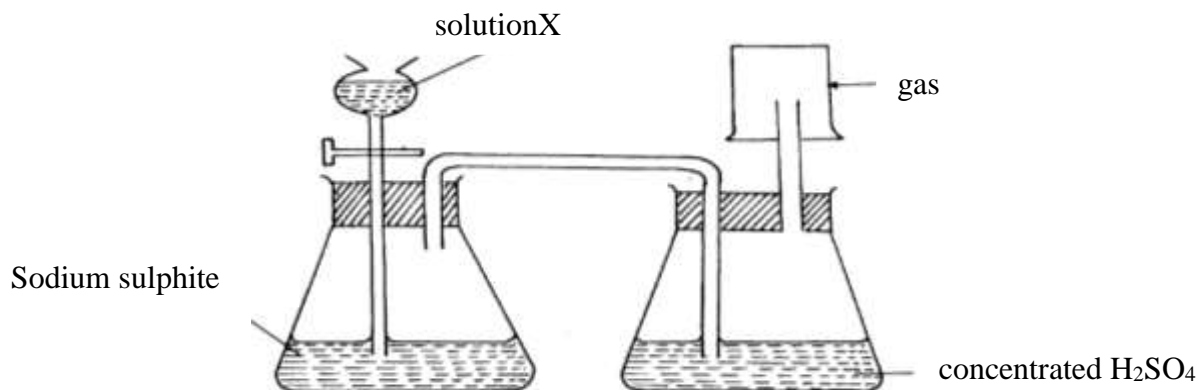


1. The diagram below shows extraction of sulphur by Frasch process



- a) Name the substance that goes through pipe
- A \_\_\_\_\_ (1 Mk)
- B \_\_\_\_\_ (1 Mk)
- C \_\_\_\_\_ (1 Mk)
- b) Name two allotropes of sulphur (2 Mks)
- c) Explain why sulphur boils at  $444^{\circ}\text{C}$  while oxygen boils at  $-183^{\circ}\text{C}$  (1 Mk)
- d) i) State the observation made when sulphur is put in warm concentrated nitric acid (1 Mk)
- ii) Write an equation for the reaction in d(i) above (1 Mk)

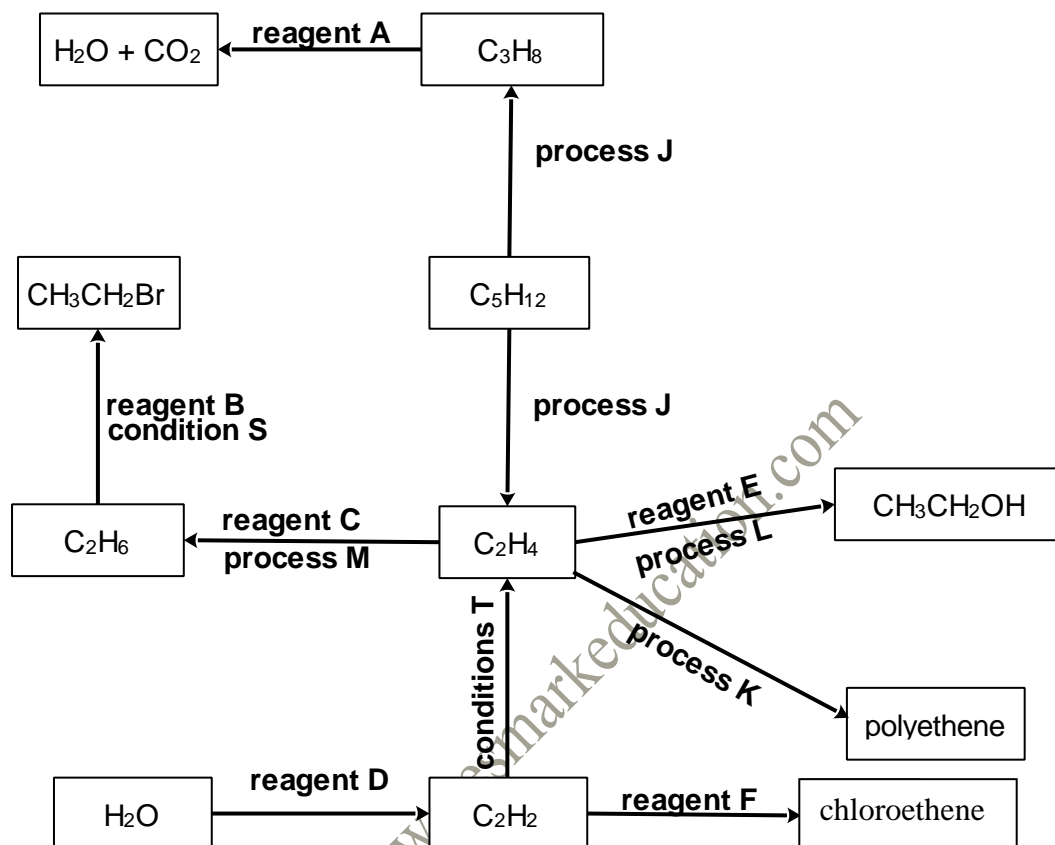
2. The diagram below shows a set-up used by a student for preparation of sulphur (iv) oxide



- i) No gas was collected in the gas jar during the experiment. Give two reasons  
(2 Mks)
- ii) Name solution X (1 Mk)
- iii) Write an equation for the reaction in the flask (1 Mk)
- e) Write the observation made when sulphur (iv) oxide is bubbled in the following solutions (1 Mk)
- i) Barium chloride (1 Mk)
- ii) Acidified potassium manganate (vii) (1 Mk)
- iii) Acidified potassium dichromate (vi) (1 Mk)
- f) When sulphur (iv) oxide is bubbled in iron (iii) chloride in a beaker:
- i) Write the formula of two anions and one cation found in the beaker (2 Mks)

- ii) State one observation made after the experiment in the beaker (1 Mk)

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



a. Name reagents

- A \_\_\_\_\_ (1 Mk)  
 B \_\_\_\_\_ (1 Mk)  
 C \_\_\_\_\_ (1 Mk)  
 D \_\_\_\_\_ (1 Mk)  
 E \_\_\_\_\_ (1 mark)  
 F \_\_\_\_\_ (1 mark)

b. Name process:

- J \_\_\_\_\_ (1 Mk)  
 K \_\_\_\_\_ (1 Mk)

L \_\_\_\_\_ (1mark)

M \_\_\_\_\_ (1mark)

c. Name conditions :

S \_\_\_\_\_ (1mark)

T \_\_\_\_\_ (1mark)

d. Draw the structural formula of the following substances

iii) Polypropene (1 Mk)

iv) Polythene (1 Mk)

v) polystyrene (1 Mk)

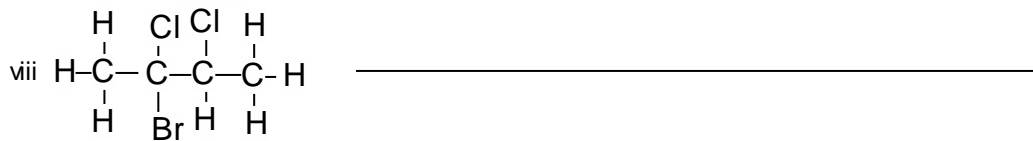
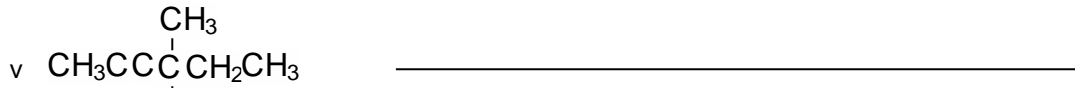
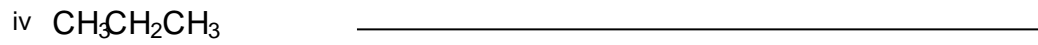
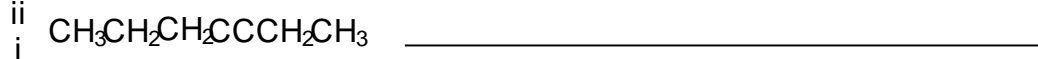
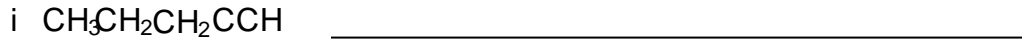
e. draw the structure of monomers from which each of the following polymers are made: (3marks)

i. perspex

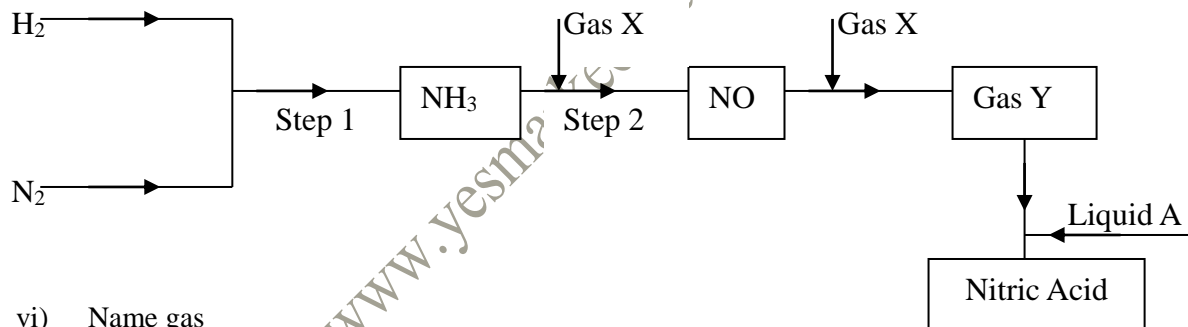
ii. polyvinyl chloride

iii. polytetrafluoroethene

f. Name each of the following organic compounds (8marks)



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



vi) Name gas

X \_\_\_\_\_ (1 Mk)

Y \_\_\_\_\_ (1 Mk)

vii) State the conditions necessary for step 1 and 2

Step 1 (2 Mks)

Step 2 (1 Mk)

viii) Write an equation for the formation of  $\text{NH}_3$

(1 Mk)

NO (1 Mk)

Gas Y (1 Mk)

g) Write the observations made when excess ammonia solution is added slowly into each of the salt solutions. (5marks)

i. Zinc chloride

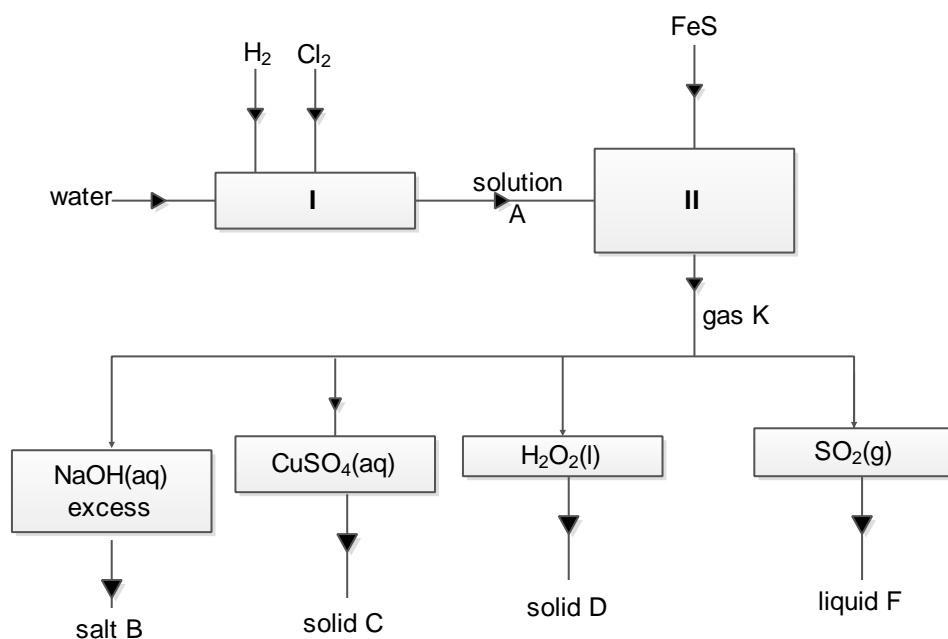
ii. Copper (ii) nitrate.

iii. Magnesium sulphate

5. Fill the table below by writing the observations made when each of the substances are mixed. (4marks)

substance	KMnO <sub>4</sub> /H <sup>+</sup> (aq)	Cl <sub>2</sub> (g)	H <sub>2</sub> S(g)	NaSO <sub>3</sub> (aq)
Br <sub>2</sub> (aq)				
FeSO <sub>4</sub> (aq)				

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



Name :

(6marks)

i. Solution A

ii. Salt B

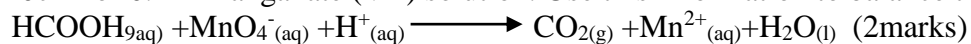
iii. Solid C

iv. Solid D

v. Liquid F

vi. Gas K

7. In an experiment to determine the chemical equation for the reaction between methanoic acid (HCOOH) and acidified potassium manganate (VII)  $20\text{cm}^3$  of  $0.25\text{M}$  methanoic acid reacted with  $20\text{cm}^3$  of  $0.1\text{M}$  manganate (VII) solution. Use this information to balance the equation.



8.  $40\text{cm}^3$  of ethane ( $\text{C}_2\text{H}_6$ ) and  $200\text{cm}^3$  of oxygen are exploded and the mixture allowed to attain the original room temperature and pressure. What is the volume of each of the remaining gases. (2marks)
9.  $60\text{cm}^3$  of gas A takes 40seconds to diffuse through a porous bottle. The same volume of gas B takes 20seconds to diffuse under the same conditions. Calculate the density of gas A at room temperature given that the density of B at room temperature is  $2.667 \times 10^{-3}\text{g cm}^{-3}$ ? (2marks)
10. 2.4g of iron (III) oxide were mixed with 1.95g of zinc and heated strongly until the reaction was complete. Calculate the mass of iron (III) oxide which was left unreacted? (2marks)
11. Calculate the total number of atoms of oxygen and hydrogen found in 1g of water. (H=1, O=16) (2marks)
12. Calculate the mass of water in 10g of hydrated copper (ii) sulphate ( $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ ) (Cu=63.5, O=16, H=1, S=32) (2marks)