NAME: ..... ADM NO: .....

SCHOOL: ..... DATE : .....

CANDIDATE'S SIGNATURE:.....

233/2
CHEMISTRY
PAPER 2
THEORY
JULY / AUGUST 2016
TIME: 2 HOURS

C [redacted] V U N [redacted] 2016

FORM 3

CHEMISTRY
PAPER 2
TIME: 2 HOURS

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INSTRUCTIONS TO CANDIDATES

- Write your **Name, Admission Number** and **School** in the spaces provided above.
- Answer **all** the questions in the spaces provided after each question.
- Mathematical tables and non-programmable electronic calculators **may be** used.
- ALL working **must** be clearly shown where necessary.

FOR EXAMINER'S USE ONLY

QUESTIONS	MAX SCORE	CANDIDATE'S SCORE
1 - 10	80	

1. The table below represents part of the Periodic table. The letters are not the actual symbols of the elements. Study it and answer the questions that follow.

Element	Number of protons		Atomic radius(nm)	Boiling Point ^0C
W	2	2,	0.93	-269
X	10	2,8	1.31	-246
Y	18	2,8,8	1.54	-186
Z	36	2,8,18,8	1.89	-152

(a) In which group of the periodic table are the elements in the table above? Explain. (2mks)

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(b) Write down the electron arrangement of elements W and X. (2mks)

(c) Explain the observation and if a mixture of W and oxygen is ignited. (2mks)

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(d) State and explain the trend in boiling points of elements W to Z. (2mks)

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(e) Explain why the atomic radius of W is smaller than that of X. (2mks)

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(f) (i) State **one** use of element Y. (1mk)

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.....

(ii) Metal P is a group 2 element in the Periodic table and just below q in the same group.

(a) Explain how the reactivity of meals P and Q with bromine compares. (2mks)

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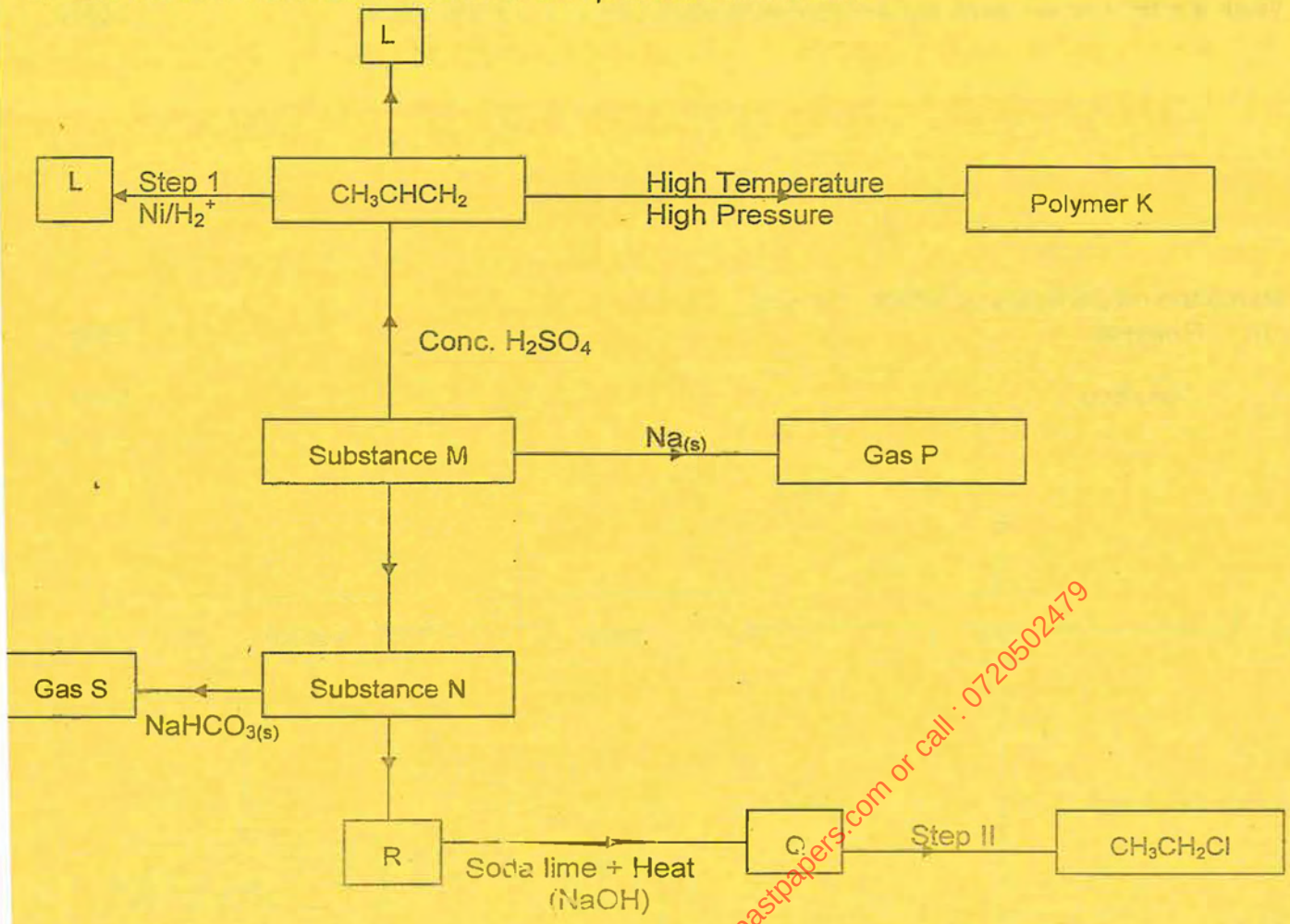
2. Use the flow chart below to answer the questions that follow.



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(a) Name the following:-

(i) Gas S (1mk)

.....

(ii) Gas P (1mk)

.....

(iii) Compound J (1mk)

.....

(b) Name processes in:

(i) Step I (1mk)

.....

(ii) Step II

.....

(c) Draw two structural isomers of compound L. (2mks)

(d) Write a chemical equation for the complete combustion of substance M. (2mks)

(e) Name the reagent and condition in step II.

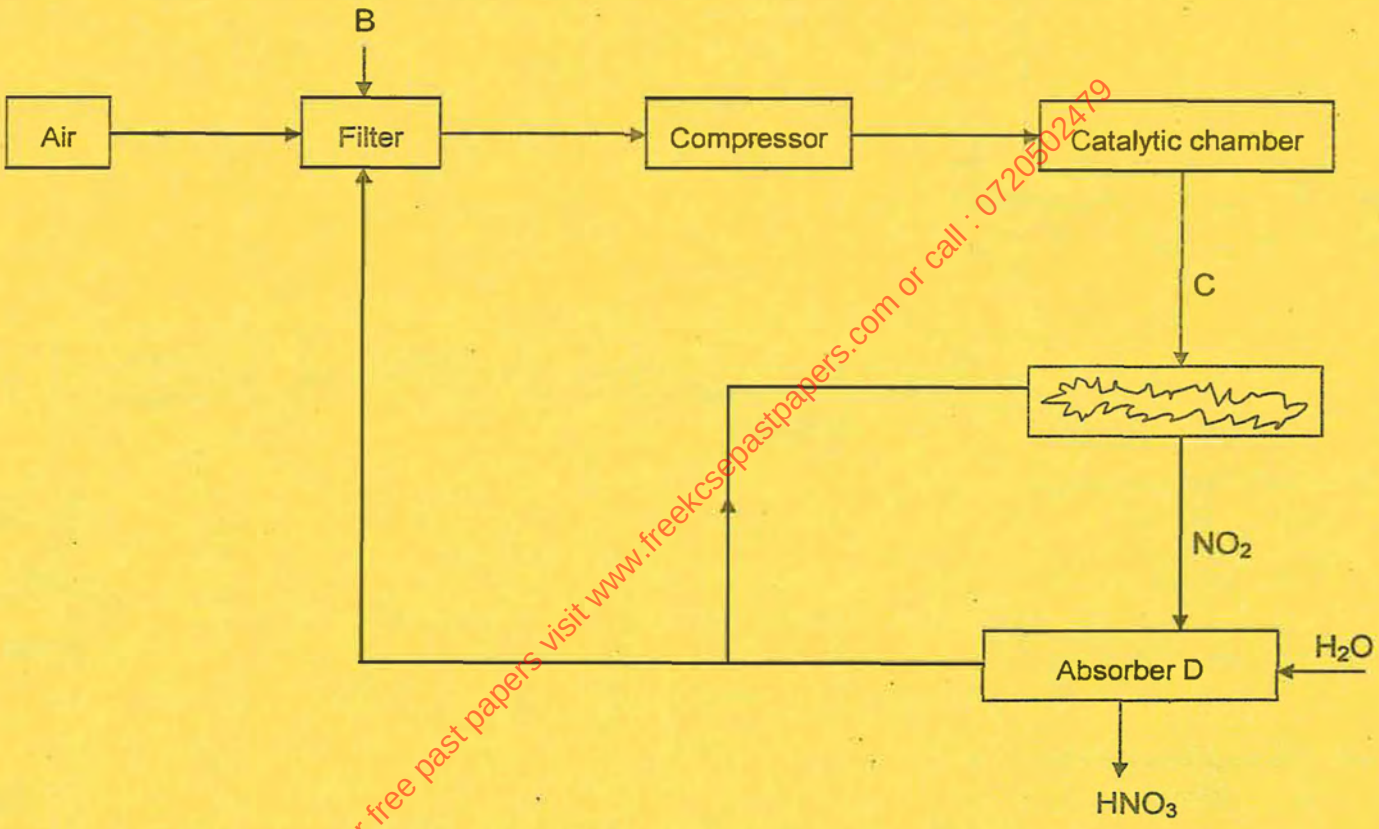
(i) Reagent (1mk)

.....

(ii) Condition (1mk)

.....

3.



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(a) Identify substance: (2mks)

B:.....

C:.....

(b) Write an equation for the reaction that occurs in the catalytic chamber. (2mks)

(c) Using equation explain the reaction that takes place in chamber D. (2mks)

(d) Nitric V acid is a colourless liquid, why does stored Nitric V acid look yellow in a transparent bottle? (2mks)

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(e) Explain what happens when Nitric V acid is added to dry warm saw dust. (2mks)

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(a) Give the meaning of the term metal pickling. (1mk)

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(b) Chlorine has adverse effects when released into the atmosphere. Explain. (2mks)

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(c) Give other compound of chlorine with their related effects in the atmosphere. (4mks)

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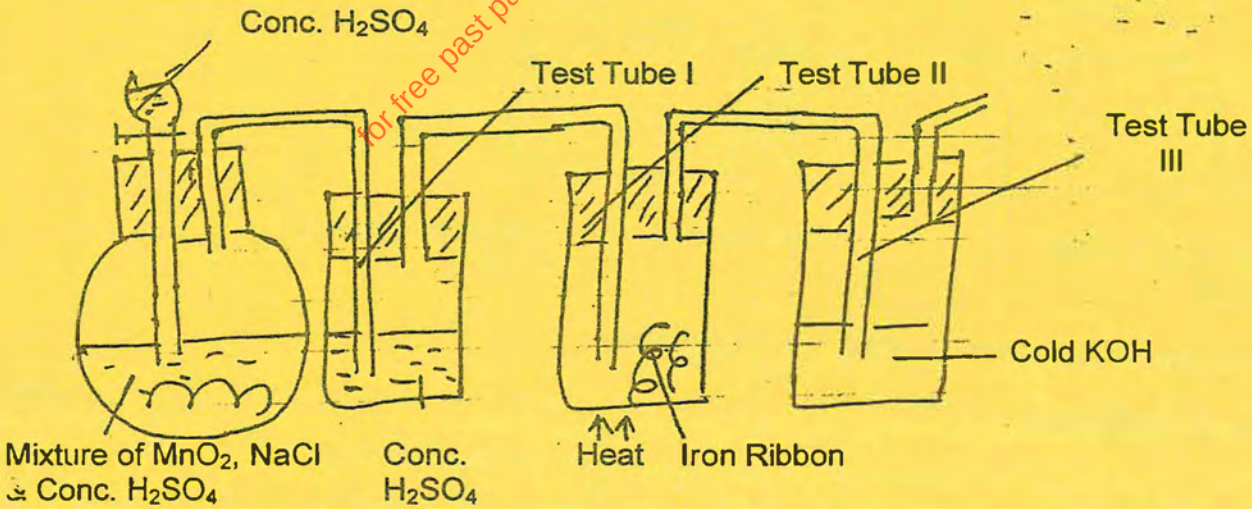

(a) Write **two** equations for the formation of gas W. (3mks)

(b) What is the role of Conc. H_2SO_4. (1mk)

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.....

(c) What observation would be made in test tube II. (2mks)

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(d) Write an equation for the reaction in test tube II. (2mks)

(e) (i) What is the purpose of cold KOH? (2mks)

.....

.....

(ii) Write an equation for the reaction between gas W and cold KOH. (2mks)

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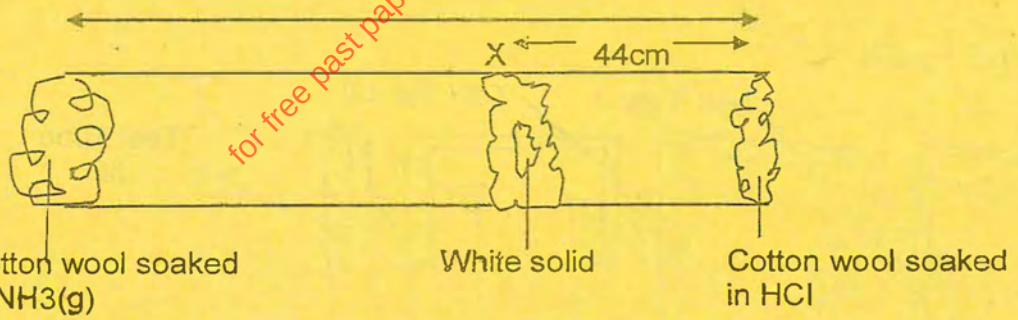
6. Cotton wool was soaked in aqueous solution of NH3 and Conc. HCl and inserted into both ends of combustion to investigate their diffusion effect as shown below.



After some time white fumes at region x are observed.

(a) Name the white solid. (1mk)

.....

(b) Calculate the distance covered by Ammonia. (3mks)

7. (a) The density of gas M is $1.2506 \times 10^{-6} g/cm^3$ and gas N is $1.4290 \times 10^{-6} g/cm^3$.

i) Which gas is lighter? (1mk)

.....

ii) How many times will the lighter gas diffuse faster than the heavier gas? (2mks)

8. Use the information below to complete the table.

Test	Observation	Inference
To about $3cm^3$ of salt solution add $2cm^3$ of $BaCl_2$ solution.	(i):.....2m	SO_4^{2-}, SO_3^{2-}, or CO_3^{2-} present.
Add about $3cm^3$ of dilute hydrochloric acid.	(ii).....2m	SO_4^{2-} present.

9. The following metals were burnt in excess oxygen. Fill the table below. (6mks)

Metal	Colour in Flame	Formula of oxide
Copper	(i)	
Calcium	(ii)	
Sodium	(iii)	
Magnesium	(iv)	

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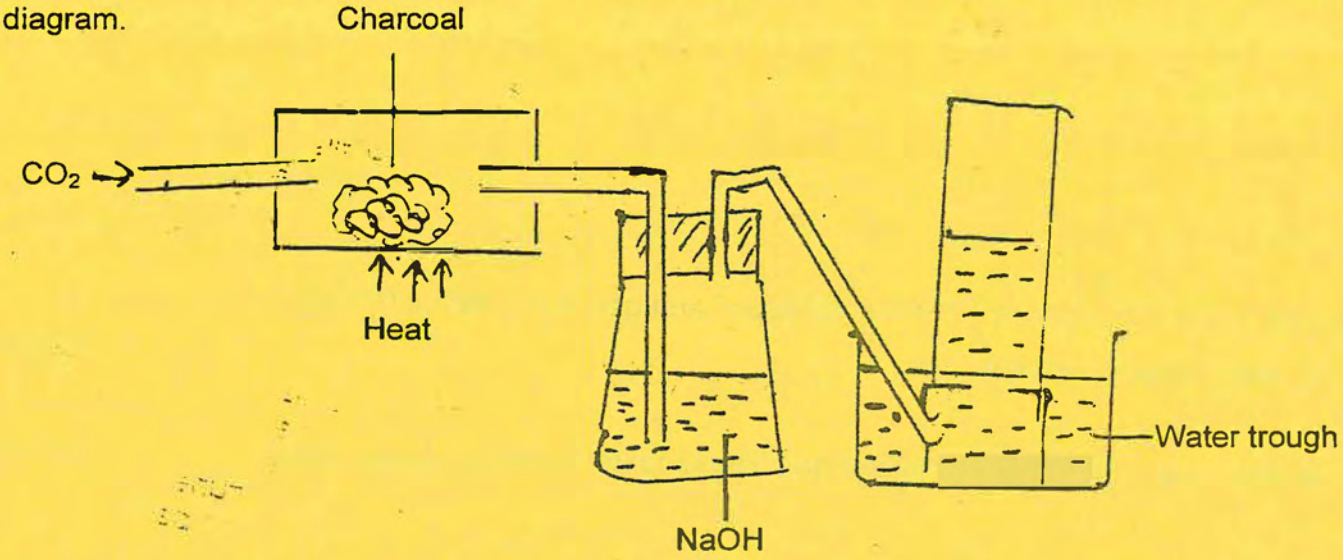
10. In an experiment, CO_2, was passed over heated charcoal and the gas produced as shown in the diagram.



(a) Write an equation for the reaction that took place in the combustion tube. (2mks)

(b) Name another chemical substance that can be used instead of sodium hydroxide. (1mk)

(c) Describe a simple chemical test to distinguish between Carbon II oxide and Carbon IV oxide. (2mks)

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(d) What is the purpose of sodium hydroxide? (1mk)

.....

(e) What property of the gas makes it possible to be collected as shown above? (1mk)

.....

(f) State **one** use of Carbon II Oxide. (1mk)

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