NAME:……INDEX NO:……

CANDIDATES SIGNATURE…….

DATE……..

SCHOOL…….

233/1

CHEMISTRY

PAPER 1

MARCH/APRIL 2010

2 HOURS

THE ELDORET EAST INTER SCHOLL EXAMINATION-2010

Kenya CERTIFICATE OF Secondary Education.

FORM FOUR

233/1

BIOLOGY

PAPER 1

MARCH/APRIL 2010

2 HOURS

INSTRUCTIONS TO CANDIDATES;

Write your name and index number in the spaces provided above.

Sign and write the date of examination in the spaces provided above

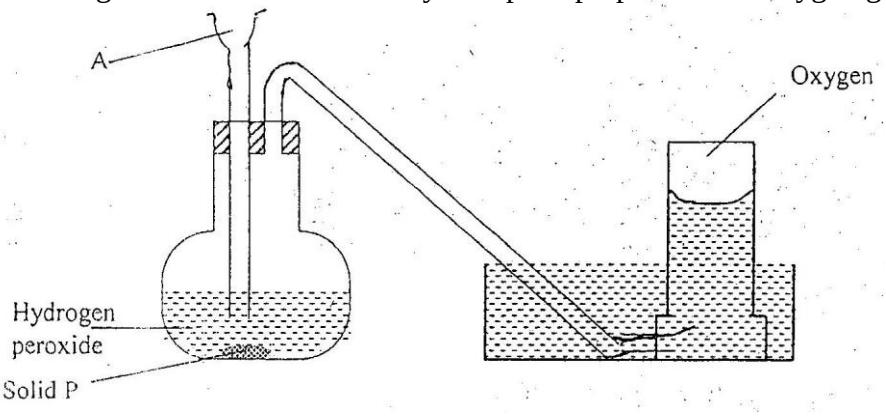
Answer **All** the questions in the spaces provided in the question paper.

All working **Must BE** clearly shown where necessary

Mathematical tables and electronic calculators may be used

Question	Maximum Score	Candidates Score
1-31	80	

1. The diagram below is a laboratory set up for preparation of oxygen gas.



(a) Name

(i) The apparatus marled A (1MK)

……

(ii) Solid P……. (1mk)

(b) Write an equation for the reaction that takes place in the flask. (1mk)

……

……

2. When magnesium is burnt in air, it react with both nitrogen and oxygen. Write the formulae of the two products formed (2mks).

……

……

……..

3. An element X forms an ion with the formula X+.The electronic of the ion is 2.8.

(i)Name the chemical family of element X (1MK)

…….

ii) .Write a chemical equation for the reaction of element X in cold water. (1mk).

……

……..

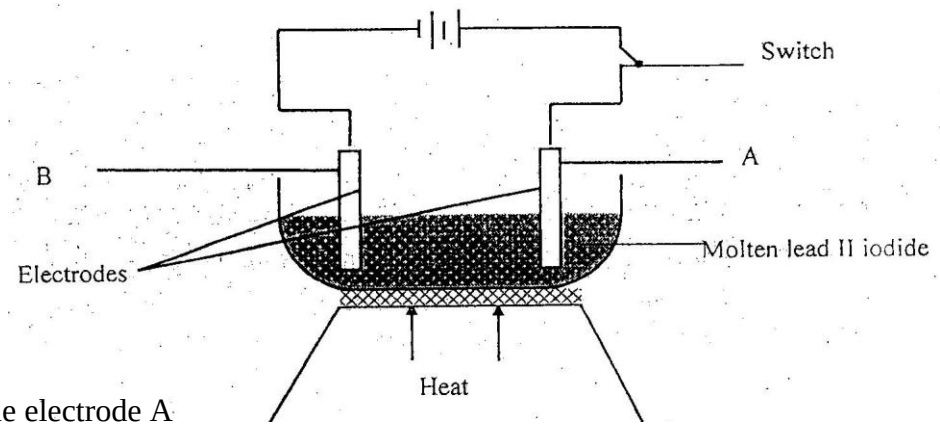
iii. State and explain the effect of the resulting solution in(ii) above on litmus paper(1mk)

……

……

…….

4. Study the set up below and answer the question that follows.



(i)Name electrode A (1/2)

……

ii.Write the half equation in electrode B when the switch is closed (1mk)

……

iii) .Explain why heating is necessary in the set up. (1mk)

……

5. Chlorine reacts with ethane as shown below

$C_2H_6(g) + Cl \longrightarrow C_2H_5Cl(g) + HCl(g)$

(a) What condition is necessary for this reaction to occur (1/2mk)

……

(b) Name the type of reaction that occurs (1/2)

……

6. a) What is meant by isomerism (1mk)

……

(b) Draw and name two isomers of a compound whose molecular formula is C_4H_{10}.(2mks)

7. Alkaline earth metals get progressively more reactive down the group while halogens get progressively less reactive down the group. Explain (2mks)

……

……

8. (a) An element P has atomic number17.It forms compound with element G.Using dots(.)and crosses(x) to represent electrons. Draw a diagram to show the bonding in the compound. (2mks).

(b) Molecular compounds have lower melting points compared to ionic compounds.Expalin why this is so.

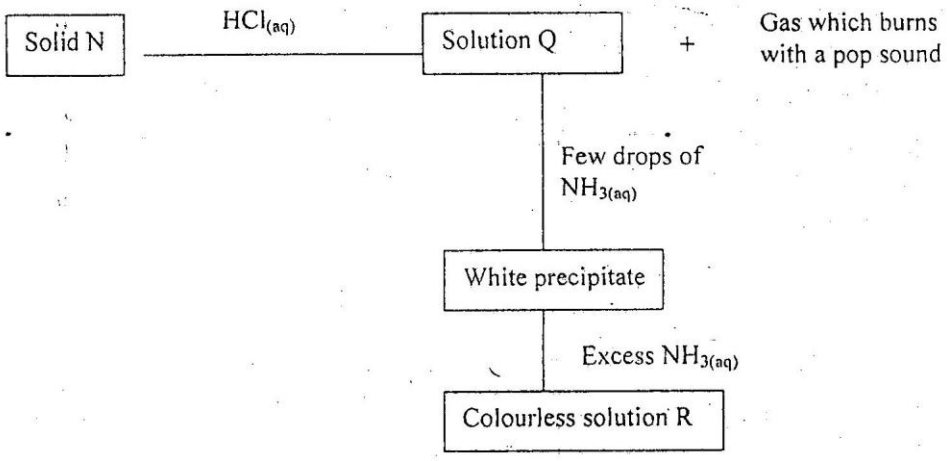
……

……..

……

……

9. The scheme below shows some reaction sequence starting with solid N.



(a) Identify solid N.

……

……..

(b) Write the formula of the complex ion in solution R. (1MK)

……

……

……..

c).Give an importance of hard water (1mk)

……

……

…….

10. Dry carbon (II) gas react with lead(II)oxide as shown in the equation

(a)Name the process undergone by lead (II) oxide (1mk)

…….

(b) Give a reason for your answer in (a) above (1mk)

…….

c) Name any other gas that can be used to perform the same function as carbon (II) oxide gas in above reaction.

……

……

……..

11. Using the equation below, identify the substance that cats as a abase in the forward reaction

Substance: (1mk)

……..

Reason: (1mk)

……..

12 a).Nitrogen(IV) Oxide is one source of environmental pollution. Explain (1mk)

13. Give two main source of nitrogen (IV) oxide in the atmosphere (1mk)

14.A student was given four carbonates labeled A,B,C and d to heat and test for carbon(IV) OXIDE GAS. He obtained the following results.

Carbonates	Color before heating	Colour after heating (hot)	Test for carbon (IV) Oxide
A	White	White	Negative
B	White	Yellow	Positive
C	Green	Black	Positive
D	White	Red	Positive

Which carbonate can be used to soften water? Explain your answer (2mks)

……

……

15.a)Study the equation below and answer the questions that follow

$I_{2(s)} \rightleftharpoons I_{2(g)}$

9.(i) What conditions must be present for the changes represented by the equation above to occur (1mk)

……

……

ii.) Name the process represented by the equation above (1mk)

……

……..

b.) How can the purity of a substance be determined (1mk)

……

……

16. An atomic of element Q can be expressed as 31/15Q.The letter dose not represent the actual symbol of the element.

a.) Write down the symbol of the most stable ion of element Q.

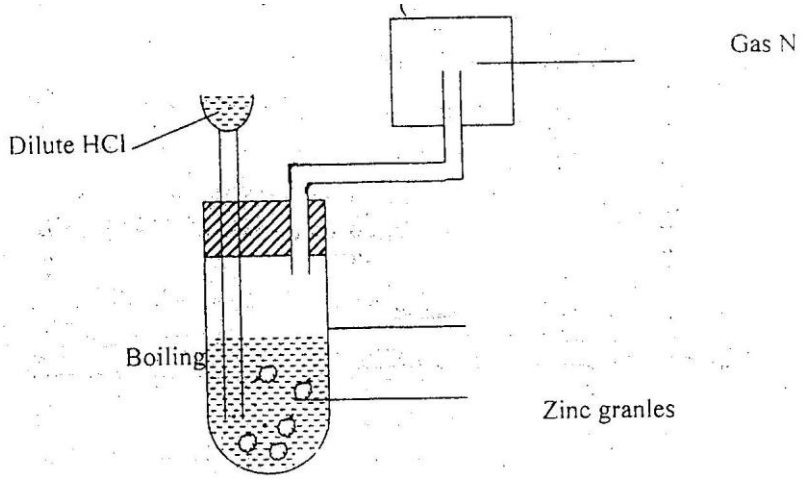
……

b).Write down the electronic arrangement of the ion element Q.

……

……

17. Zinc metal was reacted with dilute hydrochloric acid as shown in the figure below. Study it and answer the question that follows.



a.) Name gas N..

……...

b).How can one tell if all acid has reacted?(1mk)

……

……

c) Write down a balanced ionic equation to show the reaction taking place in the boiling tube.(1mk)

……

……

……

18.1.47kg of CaCL was heated to a constant mass of 1.11G.Find the value of x.

Ca=40, Cl=35.5, H=1, O=16 (3MKS.)

19.(a.)Distinguish between the mass number and the relative atomic mass of an element.

c.) Why is the atomic radius of magnesium larger that it's ionic radius.

When a green solid M was heated strongly in a test, a black residue and a gas which formed a while precipitate with lime water were formed.

a).Identify solid M (1MK)

……...

b) .Write down a balanced chemical equation to show the reaction between the balck residues and dilute sulphuric acid (1mk)

20. State and explain why magnesium continues to burn is SO2 gas.(2mks).

21. Excess chlorine was bubbles into hot concentrated sodium hydroxide

a.) Write equation of reaction above.(1mk)

B).Calculate the oxidation number of chlorine in the chlorine formed (1mk)

22. Bottles of sodium carbonate, sodium chloride and sugar have lost their labels student prepares and tests an aques solution of a sample from each bottle. The results obtained are as shown in the table below.

Bottle	**Ph**	**Electrical conductivity**	**Correct label**
1	7	CONDUCTS	
2	7	Dose not conduct	
3	10	Conduct	

Complete the table by filling correct label for each bottle.

23. Bleaching powder is used to treat water in drinking water supply plants. Briefly explain how it eradicates the micro-organisms from water.(2mks)

……

……

……

24. What would you observe when the following tests are carried out in Iron (II) Sulphate Solution.

i.) little aqueous ammonia is added to iron (II) sulphate solution.(1mk)

……

……

……

ii.) A few drops of concentrated nitric acid are added to Iron (II) Sulphate solution and warmed gently.(1mk).

……

……..

iii) Excess aqueous ammonia is added drop wise to the mixture in (II) above(1mk)

……

……..

25. State two uses of Ammonia (2mks).

……

……

……

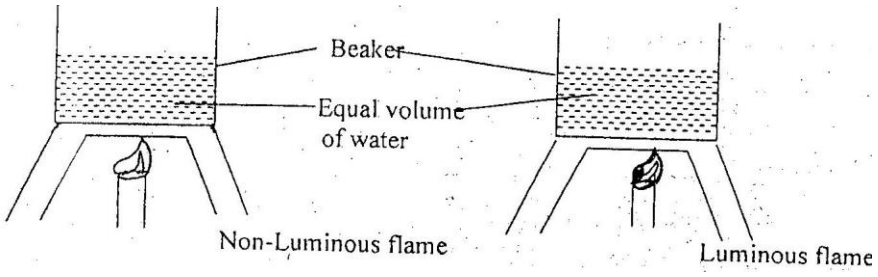
26. Starting from powered sulphur, describe how you would prepare a sample rhombic sulphur.(3mks).

……

……

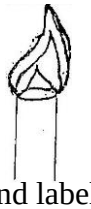
…….

27. The diagram below shows an experiment to compare the heating effects of luminous and non-luminous flame.



a) .State and explain the observation made at the bottom of each beaker at the end of the experiment.(1mk)

b.) The diagram below represents a luminous flame.



On the diagram, mark and label the hottest and coolest parts of the flame.(1mk0

c) .When not in use, it is advisable to put off a non-luminous flame or turn it to a luminous falme.Expalin.(1mk)

a.)Name any two water pollutants (1mk)

d.)Describe the chemical test for water.(2mks)28.The molar masses of gases Y and Z are 28.0 and 44.0 Respectively. If a volume of 280cm3 of gas Y diffuses through a membrane in 70 seconds, how long will it take 400cm3 of gas Z to diffuse through the same membrane.(3mks)

29. The table below contains some information about the properties of oxides. Use the information in the table below to answer the questions that follow. Letters A, B, C, D, E& Z are not actual symbols of the elements.

a.) The melting pointy of oxide of B is higher than that of the oxide of A. Why? (1mk)

i.) Write the formula of the chloride of B. (1mk).

ii.)State one possible use of calcium oxide (1mk)

30.(a)What is absolute Zero Temperature? (1mk)

(b.)A gas occupies a volume of 600cm3 pressure of 760mmHg and a Temperature of x. C,at pressure of 780mmHg and Temperature of 50 C,The gas occupies a volume of 633.66cm3.Determine the value of x.

NAME:……INDEX NO:……
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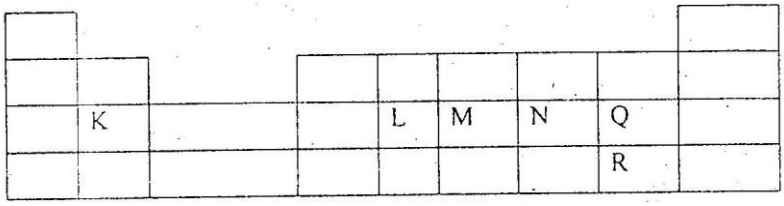
233/2
CHEMISTRY
PAPER 2
MARCH/APRIL 2010
2 HOURS
THE ELDORET EAST INTER SCHOLL EXAMINATION-2010
Kenya CERTIFICATE OF Secondary Education.
FORM FOUR
233/2
CHEMISTRY
PAPER 2
MARCH/APRIL 2010
2 HOURS

INSTRUCTIONS TO CANDIDATES;

- Write your name and index number in the spaces provided above.
- Sign and write the date of examination in the spaces provided above
- Answer **All** the questions in the spaces provided in the question paper.
- All working **Must BE** clearly shown where necessary
- Mathematical tables and electronic calculators may be used

Question	Maximum Score	Candidate score
1	12	
2	10	
3	06	
4	08	
5	11	
6	12	
7	12	
8	09	
Total	**80**	

1. The grids represent parts of the periodic table. Study it and answer question that follow. The letters do not represent the actual symbols of the elements.



(a).(i).Write down the electron configuration of element N (1/2MK)

……

……

ii).Using dots (.)Or crosse(x) to represent electronics, draw a diagram showing the formation of an ion of element N. (1/2)mk -).

b.)What type of structure could the oxide of K have? Explain. (2mks)

c.)How does the reactivity of R and Q Compare? (2mks)

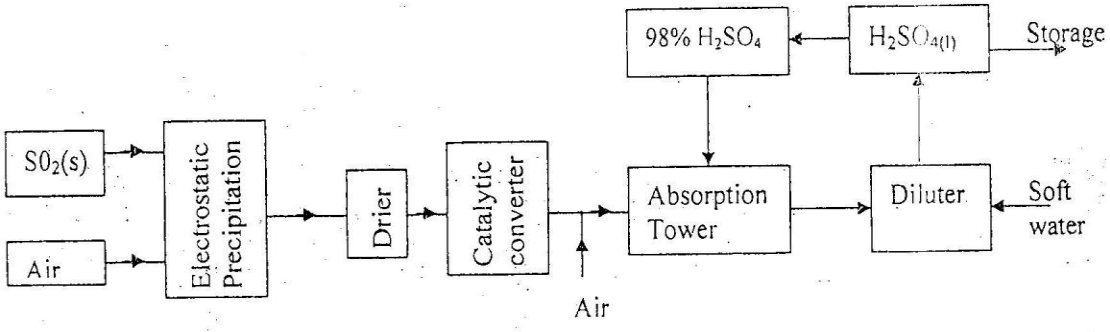
d.)1.2g of K reacted completely with 1110 cm3 of chlorine gas at s.t.p (1 mole of gas occupies 22.4dm3).

i.) Write a balanced equation for the reaction between K and chlorine.(1mk)

ii.)Determine the relative atomic mass K.(3MKS)

ii) .Explain the observation that would be made if a nitrate of K is heated.(2mks).

2. The flow chart below shows the industrial preparation of sulphuric (vi) acid. Study it and answer the question the follow.



a).i.)With the help of an equation, state one source of sulphur (iv) oxide.(11/2)

ii.)Name a suitable substance that can be used in the drier.(11/2)

iii).In the catalytic converter, the temperature is adjusted to about 45.C without external heating.

Explain (1mk)

iv.) Write an Equation for the process taking place in a absorption tower? (1mk)

v) Why is it not advisable to use hard water in the diluter?(1mk)

vi.) Name one solid waste produced in this process.

b.) Nitric (V) acid and hydrogen chloride can be prepared in the laboratory by heating a nitrate and chloride respectively with concentrated sulphuric (VI) acid. What property of concentrated sulphuric (VI) acid makes it suitable for the preparation of nitric (v) ACID and hydrogen chloride. (1mk)

c.)How does the bleaching affects of sulphur (VI) oxide gas band chlorine gas compare (2mks)

3. The equation below shows the molar enthalpies of combustion of carbon, hydrogen and molar of formation of methane.

$C_{(s)} + 2H_{2(s)} \longrightarrow CH_{4(g)}$ $\Delta H_f = -73.1$ KJ/mol

$C_{(s)} + O_{2(g)} \longrightarrow CO_{2(g)}$ $\Delta H_C = -394$KJ/mol

$H_{2(g)} + \frac{1}{2} O_{(g)} \longrightarrow H_2O_{(l)}$ $\Delta H_C = -285$KJ/Mol

a).(i.)Draw the energy cycle diagram and work out the enthalpy of combustion of methane. (3mks).

b.Given that the ,molar heat of combustion of butane is-2877KJ/Mol and that C=12,H=1,calacualte heat value in KJ/gram.

i. Methane (CH4)(1mk)

ii.Butane.(1mk)

ii.

From the results in b(i) and ii above, which one is the better fuel.(1mk)

4.Auqeous hydrochloric acid was reacted with sodium sulphite and a gas A evolved when this gas was dried, mixed with oxygen and then passed over a catalyst B,maintained at 400.Can

exothermic reaction occurred. The product was cooled by an ice-salt mixture and colourless crystals were formed. When very low PH value resulted.

a.) Identify (2mks)

A…….

B……..

C……..

D……..

b.)Write equations for the reactions which led to the formation of (2mks)

A……..

B……

c) Suggest a suitable drying agent for gas A.

……

……

……..

(d.)State and explain what would happen to the yield of c if the temperature of the catalysts were raised to 600C. (1mk)

……

……

……

(e.)Write an ionic equation for the reaction which would occur between solution D and Z and Zinc Metal. (1mk).

……

……

……

……

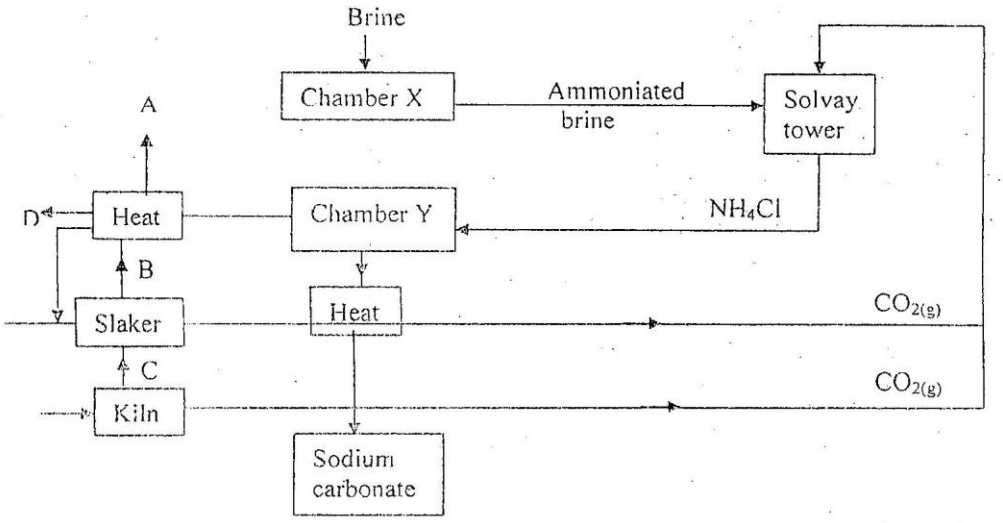
f) Describe one chemical test which could be used to identify gas A. (1mk)

……

……

…….

5. The flow below represents the main steps in the preparation of sodium carbonate.



a.) Name the substance labeled. (2mks)

A…….

B……C

……

D……..

B.Cold water is made to circulate around X. What does this suggest about the reaction between A and brine**(1/2mks)**

……

……

c.)What process takes place in chamber Y.? **(½ MK).**

……..

……..

……..

d.)Name two by-products that are recycled in this process. **(1MK)**

e.)Why is recycling important? **(1mk)**

……

……..

f.) Write the equation for the reaction that takes place in the upper part of solvay Tower(1MK)

……

……

……

g.)Assuming that there was no recycling in this process, two moles of ammonia would be required for producing one mole of an hydrous sodium carbonate. Calculate the volume of ammonia at s.t.p that would be used to produce 10.6 kg of sodium carbonate by a factory operating at 80% efficiency.

(C=12,O=16.H=1,Na=23,N=14,I mole of gas occupies 22.4 dm3 at s.t.p) **(3mks)**

……

……

……

h.) Give two industrial uses of sodium carbonate **(2mks)**

……

……

……

6.(a) Study the information in the table below and answer the question that follow.

Number of carbon atoms	**Relative molecular mass of hydrocarbon**
2	28
3	42
4	56

i.) Write the general formula of the hydrocarbons in the table **(1mk).**

……

……..

ii.) Predict the Relative Molecular Mass (RMM) of the hydrocarbon with 6 carbon atoms **(1mk)**

……

……

……..

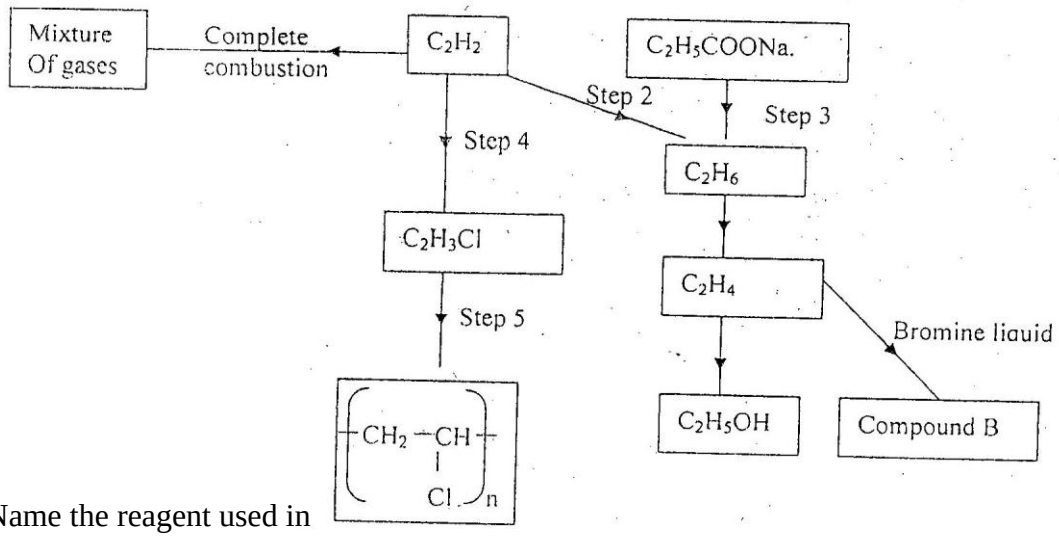
ii.) Determine the molecular formula of the hydrocarbon in(ii) above and draw its structural formula (C=12,H=1) **(2mks)**

……

……

……

b.) The scheme below shows some reactions of substances. Study it and answer the question that follows.



I.Name the reagent used in

Step 2:……..**(1mk)**

Step 3:…….(**1mk)**

Step 4:…….**(1mk)**

ii.) Write an equation for the complete combustion of ethyne **(1mk)**

……

……

iii.) Write down the name and structural formula of compound B. **(2MKS)**

Structural formula

Name

iv) Give the homologous series that the compound formed in step 3 and step 2belong to**.(1mk**)

……

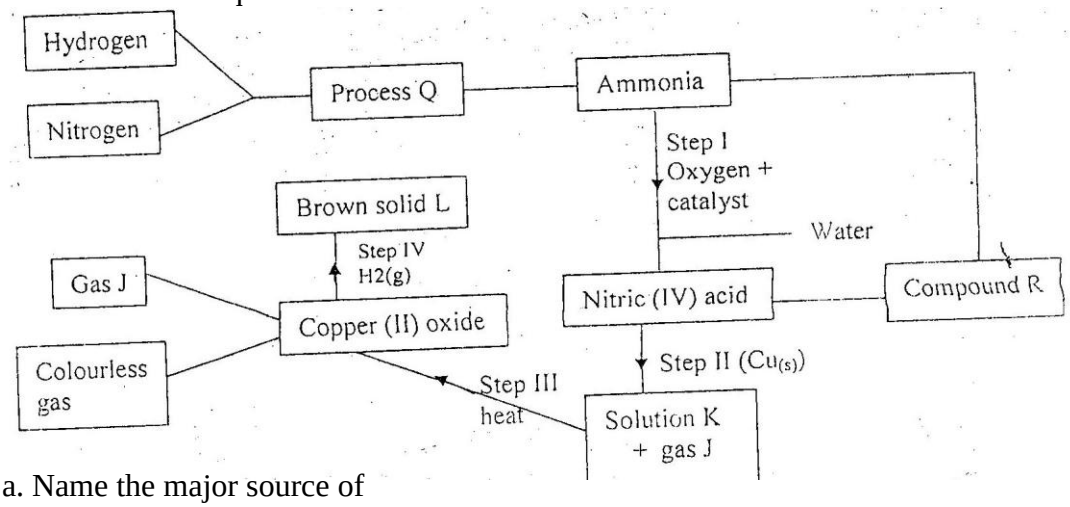
……

v.) Explain what you understand by the term hydrocarbon**.(1mk**)

……

……

7. The scheme below shows various reactions starting with hydrogen and nitrogen gases. Study it and answer the questions that follow.



a. Name the major source of

i.) Hydrogen **(1/2mk)**

……

……..

ii).Nitrogen **(1/2mk)**

……

……..

b.Name the catalysts and explain why its used in step 1**.** **(1mk)**

……

……

c.)Identify

i)Solid L (1MK)

……

……..

ii).Gas J (1mk)

……

……

iii.) Process Q (1mk)

……

……

d.) (i.)Name compound R and state one use (1mk).

……

……

ii.Determines the percentage of nitrogen in compound R.

(N=14, 0, H=1,0 O=16.0) (3mks)

(e) (.i.) Write two equations for the reaction in step 1. (2mks)

……

……..

ii.) Using an equation explain the observation made in step II. (2mks)

……

……

8. The solubility of two salts D and E are given in the following table. In each case solubility per 100g of water.

Temperature(0c)	10	20	30	40	50	60	70	80
Solubility of D	17	21	24	29	34	40	47	56
Solubility E	35.8	36.0	36.2	36.8	36.8	37.3	37.6	38.0

Using the data, plot solubility curves (solubility against Temperature) of D and E on the same axes on the graph paper below. Use your graph to answer the question that follows. (4mks)

(a.) At what temperature are the solubilities of the two salts equal? (1mk)

……

……

……..

(b.)Estimate the solubility of D at 0c. (1mk)

……
……

(c.)A saturated solution of E in 50grams of water at 25 was evaporated to dryness .What was the mass of the residue (1mk).

……
……..

d.)The saturated solution obtained was each cooled to 20 C.Calculate the total mass of the salts precipitated. (2mks)

……
……
……..

NAME…….INDEX NO…….
CANDIDATES SIGNATURE…….
DATE……

233/3
CHEMISTRY
PAPER 3
MARCH/APRIL 2010

THE ELDORET EAST INTERSCHOOLS EXAMINATION-2010
END OF TERM 1 2010 FORM FOUR
Kenya certificate of secondary Education
233/3
CHEMISTRY
PAPER 3
MARCH/APRIL 2010

Instructions to candidates

- Write your name and index number in the spaces provided
- Sign and write the date of examination in the spaces provided above
- Answer all questions in the spaces provided in the question paper
- You are NOT allowed to start working with the apparatus for the first 15 minutes of the $2^{1/4}$ hours allowed for this paper. This time is to enable you to read the question paper and make sure you have all the chemicals and apparatus that you may need.
- All working MUST be clearly shown where necessary.
- Mathematical tables and electronic calculators may be used.

Question	Maximum score	Candidates score
1	17	
2	15	
3	08	

1.(a)You are provided with
(b) Solution A 0.03 sodium hydroxide
© Solution B 1m hydrochloric acid
(d) Solid Q I gram of hydrated metal carbonate $M2co^3.x\ h2o$
You are required to determine

- The value of x $M2co^3.xH2o$
- The volume of CO2(g) at room temperature and pressure

Procedure
(i) Using a pipette and pipette filler place $25cm^3$ of solution B into a conical flask. Carefully add all solid Q and wait for about four minutes until effervescence stops.
(ii) Transfer the resulting solution into a 250 ml volumetric flask using a funnel. Rinse the conical flask with a little distilled water and transfer the washing into the volumetric flask.
(iii) Add more distilled water to the solution in the volumetric flask to make up to the mark. Shake the resulting solution well and label it C.
(iv) Rinse the burette with solution C. Using a pipette and pipette filler, place $25cm^3$ of solution A into a 250ml conical flask. Add 2 drops of solution A into a 250ml conical flask. Add 2 drops of phenolphthalein indicator and titrate solution A with solution C. Record your results in the table 1 below.
(v) Repeat the titration two more times to obtain two other readings and complete the table.

	I	II	III
Final burette reading (cm^3)			
Initial burette reading (cm^3)			
Volume of solution C (cm^3)			

(a)Calculate the
(i) Average volume of solution C used (1mk)

(ii) Moles of sodium hydroxide in $25.0cm^3$ of solution A used (1mk)

(iii) Moles of hydrochloric acid in the average volume of solution C used (2mks)

(iv) Moles of hydrochloric acid in 25.0 cm^3 of solution C (1mk)

(v) Moles of hydrochloric acid in the original $25cm^3$ of solution B (2mks)

(vi) Moles of hydrochloric acid which reacted with solid Q (1mk)

(vii) Molar mass of solid Q hence the value of x given that the equation for the reaction between solution B and solid Q is

$M_2co^3(s) + 2HCL_{(aq)} \rightarrow 2mcl_{(aq)} + H2o_{(l)} + Co_{2(g)}$

(M=23.0, C=1.0, H=1.0, O=16)

(viii) Volume of CO2 (g) evolved at room temperature and pressure in the reaction in (vii) above. (Molar gas volume=24.0dm3)

2. Using the 50ml measuring cylinder provided, measure accurately 300cm^3 of the 2M NaoH labeled solution P. transfer this solution into a clean 100ml plastic breaker.
Fill the burette with solution R which is dilute hydrochloric acid.
Use the thermometer provided to determine the steady temperature of solution P in the plastic breaker (do not remove the thermometer from the solution)
Add exactly 5 cm^3 of solution R from the burette into the beaker and stir gently using the thermometer. Read the highest temperature reached. Repeat adding 5cm^3 of solution R after every 30 seconds up to 180 seconds and note the highest temperature reached after the addition.

Record your results in the table (II) below

Time (seconds)	0	30	60	90	120	150
Volume of solution P	30	30	30	30	30	30
Volume of solution R						
Total volume (cm^3)						
Temperature (ºC)						

(a) Plot a graph of temperature °c against volume of dilute hydrochloric acid (solution R)
(Let temperature be on y-axis)

b) From the graph, determine
(i) The highest temperature reached (1mk)

(ii) The volume of solution R which completely neutralized $30cm^3$ of 2MNaOH (solution P)
(1mk)

c) How many moles of dilute hydrochloric acid completely neutralized 30cm3 of 2MNaOH
(2mks)

(d) Calculate the heat change (ΔH) in this reaction hence the molar heat of neutralization of hydrochloric acid
(Assume the specific heat capacity of water to be 4.2 kj/kg/k and the density of the solution to be 1 g/cm^3) (3mks)

3. You have been provided with solid K to carry out the test given below
(a) Place a spatula end full of solid K in a clean dry test tube. Heat the solid gently and then strongly. Test any gas using blue and red litmus papers (keep the residue for the next step)

Observations	Inference

(b) To the residue obtained in (a) above, add about $1cm^3$ of 2M HCL and shake well. Divide the solution into two equal portions

Observations	Inference
(1/2 Mk)	(1/2mk)

c) To the first portion add 2M NaOH drop wise until in excess

Observations	Inference
(1mk)	(1mk)

(d) To the second portion, add 2M Ammonium hydroxide solution drop wise till in excess

Observation	Inference
(1mk)	(1mk)