NAME:……INDEX ……..…..DATE……..…

SCHOOL:……SIGNATURE……

233/1
CHEMISTRY
PAPER 1
JULY / AUGUST, 2010
2 HOURS

KISUMU NORTH AND EAST DISTRICTS JOINT TEST
Kenya Certificate of Secondary Education 2010

233/1
CHEMISTRY
PAPER1
JULY / AUGUST 2010

INSTRUCTIONS TO CANDIDATES

- *Answer **all** questions in the spaces provided.*
- *Mathematical tables and electronic calculators **may** be used.*
- *All workings **must** be shown where necessary*

For Examiner's Use Only

Questions	Maximum Score	Candidates Score
1-26	80	

1. List the four differences between luminous and non-luminous flames. (2 mks)

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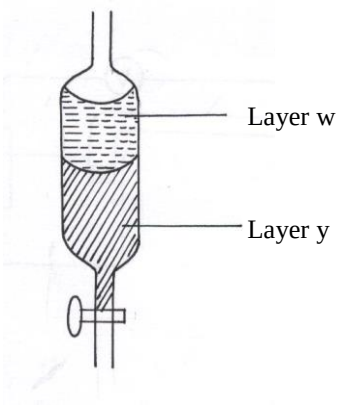
2. a) A mixture of nitric acid, and paraffin with Sodium hydroxide solution was shaken and left to separate as shown in the diagram below.



Identify components of

Layer Y (1½ mks)

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Layer W (1 mk)

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b) Explain how you would get pure paraffin from the mixture. (1½mks)

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3. Briefly describe how you would prepare a simple acid base indicator. (3 mks)

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4. a) What is the main determinant of stability of a nuclide? (1 mk)

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b) A certain nuclide has a half-life of 2½ hours. What percentage of a given mass will be left after 7½ hours? (2 mks)

c) State one use of Cobalt-60 nuclide. (1 mk)

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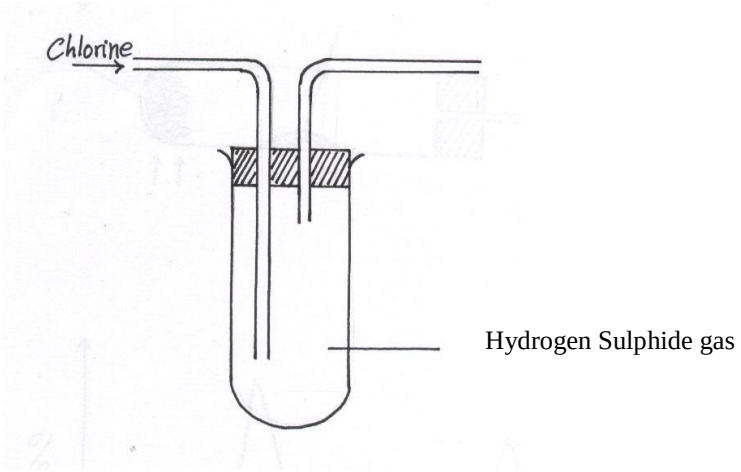
5. In an experiment, Chlorine gas reacted with hydrogen sulphide gas as shown



a) What observation is made in the boiling tube? (1 mk)

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

c) One piece of apparatus is missing to ensure proper success of this experiment. Show the missing piece on the diagram. (1 mk)

d) What precaution should be taken when carrying out this experiment? (1 mk)

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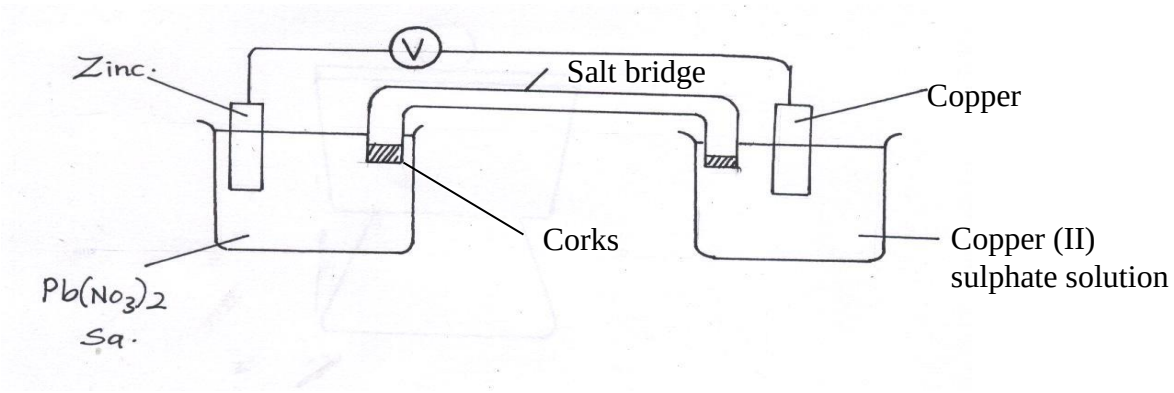
6. The diagram below shows a set up used by a student to make an electrochemical cell



a) What are the two mistakes in the set up? Explain (2 mks)

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b) If the mistakes are corrected, what is the cell representation? (1 mk)

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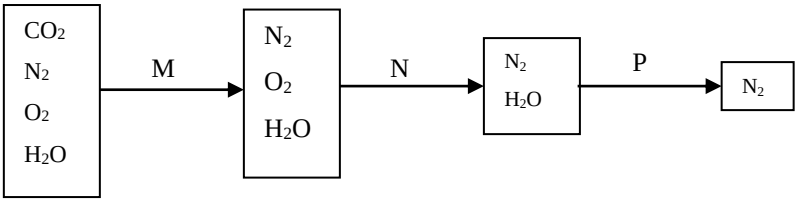
7. The flow chart below represents how Nitrogen gas can be isolated from air in the laboratory.



Explain how the following processes are carried out.

Process M (1 mk)

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……

Process N (1 mk)

……

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Process P (1 mk)

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……

8. A certain compound is formed when Magnesium ribbon is burnt in a gas jar full of Nitrogen gas

a) Name the compound formed and state what type of bond it possesses.

Name (1 mk)……

Bond (1 mk) ……

b) Using dots (.) and crosses (x) draw diagrams to show how the compound is bonded.

(2 mks)

9. a) In which homologous series do the following compounds belong?

i) CH_3CCH (1 mk)

……

ii) CH_3CH_2COOH (1 mk)

……

b) Raw rubber is heated with Sulphur in the manufacture of natural rubber,

i) What is the name given to the process? (1 mk)

……

ii) Why is the process necessary? (1 mk)

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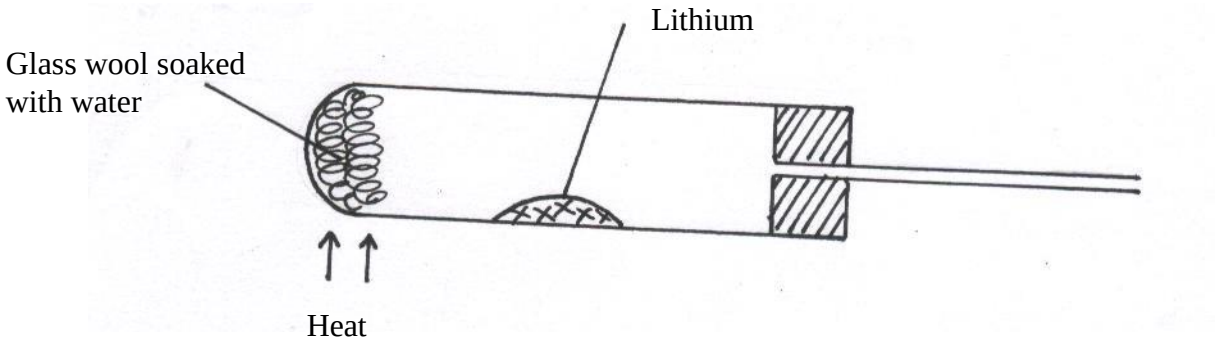
10. The diagram below represents a set-up that was used to react Lithium with water. Study it and answer the questions that follow.



a) Write an equation for the reaction that takes place. (1 mk)

b) Why would it not be advisable to use Potassium in place of Lithium in the set-up above? (1 mk)

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c) What would be observed if the product gas were to be ignited? Explain (2mks)

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11. a) State the Le Chatelier's Principle (1 mk)

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b) The solution of Chromate (VI) ions attain equilibrium as shown below

$$\underset{(yellow)}{2CrO_4^{2-}{}_{(aq)}} + 2H^+{}_{(aq)} \rightleftharpoons \underset{(orange)}{Cr_2O_7^{2-}{}_{(aq)}} + H_2O_{(l)}$$

Explain what will happen if a solution of Hydrochloric acid is added to the solution at equilibrium. (2 mks)

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12. a) In extraction of Iron, limestone is used. What is the role of limestone in the process? (2 mks)

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b) 300cm^3 of Hydrogen chloride were placed over 7.0g of heated Iron until there was no further change. The reaction vessel was then allowed to cool to room temperature. Determine the mass of iron that remained at the end of the experiment (molar gas volume = 24000cm^3; Fe = 56).

(3 mks)

13. Briefly explain how you would obtain a pure sample of Lead chloride from a mixture of Lead chloride and Silver chloride. (3 mks)

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14. a) What is a saturated solution? (1 mk)

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b) Calculate the solubility of sugar from the following experimental data:

Mass of evaporating dish	= 23g
Mass of dish + sample of saturated solution	= 192g
Mass of dish + solid after evaporation to dryness	= 142g (2mks)

15. a) A student prepared Ammonia gas and dried it using concentrated Sulphuric acid and collected it over water. Identify two serious mistakes the student made in the experiment. (2 mks)

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b) Nitrogen oxides are environmental pollutants. Give two ways in which they pollute the environment. (2 mks)

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16. Elements X, Y and Z have the following ionization energies in KJ/mole

	1st	2nd	3rd	4th
A	738	1450	7730	10550
B	495	4563	6912	9540
C	800	2427	3658	25024

Select an element which:

i) Forms a covalent chloride (1 mk)

ii) Forms a monovalent ionic chloride (1 mk)

iii) Has a common oxidation state of+2 (1 mk)

iv) Explain why the second ionization energies are higher than the first ionization energy. (1 mk)

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17. A student carried out an experiment for electrolysis of molten Lead (II) iodide

i) What did she observe at the anode? (1 mk)

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ii) Write the ionic equation at the cathode (1 mk)

18. Propane and Chlorine react as shown

$$CH_3CH_2CH_3 + Cl_2 \rightarrow CH_3CH_2CH_2Cl + HCl$$

a) Name the type of reaction that takes place (I mk)

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b) State the condition under which the reaction takes place. (1 mk)

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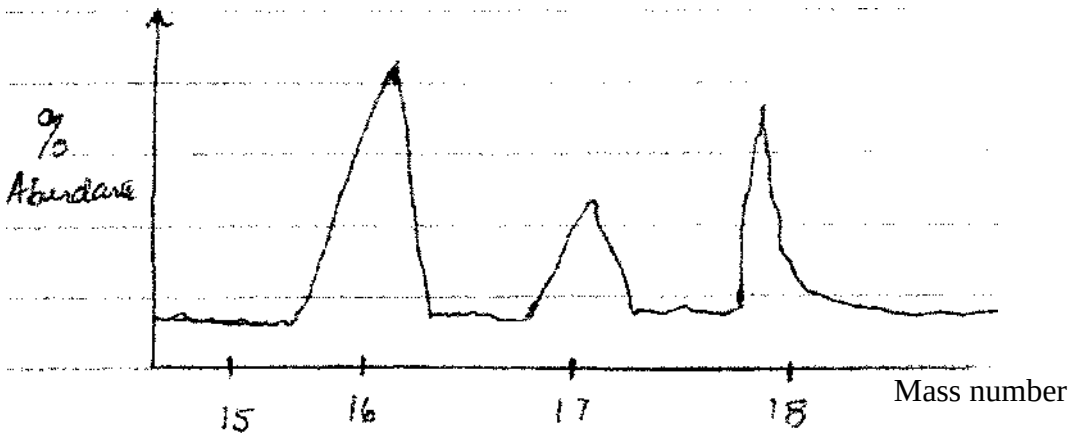
19. Given the following enthalpies of formation

Compound	Enthalpy of formation ($KJmol^{-1}$)
C_6H_6	+49.0
O_2	0.0
CO_2	-395.0
H_2O	-289.0

Calculate the molar heat of combustion of the hydrocarbon whose formula is C_6H_6

(3 mks)

20. Analysis of a sample of Oxygen gas in a mass spectrometer gave the following results



a) Given that the atomic number of Oxygen is 8. Identify the isotopes in the sample (3mks)

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b) Which of the isotopes is commonly found? (1 mk)

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21. Chlorine gas dissolved in distilled water to form chlorine water

a) Name the compounds present in the chlorine water. (2 mks)

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b) What would be observed if blue litmus paper is dipped in chlorine water. Explain. (2 mks)

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22. 20 cm^3 of methane gas diffuses through a porous plug in 25 seconds. How long will it take 100cm^3 of Sulphur (IV) oxide to diffuse through the same plug. (3 mks)

(H=1, C=12, O=16, S = 32)

23. Sodium carbonate can be manufactured in large scale by Solvay process

a) Why would the plant be sited near a river (1 mk)

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b) Name two substances recycled in Solvay process (1 mk)

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24. Draw a dessicator and state its use. (1 mk)

25. Determine the oxidation number of Sulphur in $Na_2S_2O_3$ (1 mk)

26. State any two distinctive properties of dyes in a mixture that allows their separation by paper chromatography. (1 mk)

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