

Name

Index No.....

School

Candidate's Signature

Date

233/1

CHEMISTRY

PAPER 1

JULY/AUGUST

(THEORY)

TIME: 2 HOURS

LOWER YATTA DISTRICT JOINT EVALUATION EXAM - 2011

Kenya Certificate of Secondary Education (K.C.S.E)

233/1

CHEMISTRY

PAPER 1

(THEORY)

TIME: 2 HOURS

INSTRUCTIONS

1. Write your name and index no. in the spaces provided above.
2. Answer **ALL** the questions in the spaces provided
3. Mathematical tables and Electronic calculators may be used.
4. All working **MUST** be clearly shown where necessary.

FOR EXAMINERS USE ONLY

QUESTIONS	MAXIMUM SCORE	CANDIDATES SCORE
1 - 27	80 Marks	

This paper consists of 10 printed pages.

Candidates should check to ensure that all pages are printed as indicated and no questions are missing.

1. a) Define rusting.

(1 Mark)

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b) Write the chemical name of rust.

(1 Mark)

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c) State two economic effects of rusting.

(1 Mark)

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a) The pressure exerted by a gas in a sealed container is 850kpa at 16^oc. It was found that the container might leak if the internal pressure is 1050kpa. At what temperature in ^oc will the container start to leak assuming constant volume.

(3 Marks)

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3. The table below shows substance E, F, G, H and I. Study it and answer the question that follow.

Substance	BP ^o C	M.P ^o C	Electrical solid state	Conductivity molten state
E	4627	3200	Does not	Does not
F	-78	-115	Does not	Does not
G	2501	1059	Conducts	Conducts
H	1314	799	Does not	Conducts
I	80	6	Does not	Does not

a) With a reason state which substance is likely to be;

i) A metal.

(1 Mark)

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ii) A gas at room temperature and pressure.

(1 Mark)

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iii) Have a giant Ionic structure.

(1 Mark)

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4. a) Define saturated solution.

(1 Mark)

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- b) The solubility of potassium nitrate is 120g/100g of water at 80°C and 70g/100g of water at 20°C. What mass of the salt would crystallize if 80g of potassium nitrate solution saturated at 80°C were cooled to 20°C? (2 Marks)

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The table below shows some metals and their Electronic configuration. Study it and answer the questions which follow. Letters don't represent the actual symbols.

Element	Configuration
X	2.1
Y	2.8.1
Z	2.8.8.1

- a) Describe how Z reacts with cold water. (2 Marks)

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- b) What is the effect of the resulting solution in (a) above on litmus solution. (1 Mark)

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6. The table below shows the tests that were carried out on solid R and the observation made.

Test	Observation
I. Solid R was heated	Solid N turned from white to yellow
II. Dilute HCl was added to R	A colourless solution formed
III. To the colourless solution obtained in test II, excess NaOH solution was added	A white precipitate was formed which dissolved to form a colourless solution.

- a) Write the formulae of the cation in Solid N. (1 Mark)

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- b) Identify the complex solution formed in test III. (1 Mark)

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- c) Identify the solid R. (1 Mark)

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7. How would you obtain a sample of pure Iodine from a mixture of Iodine and lead sulphate.(2 Marks)

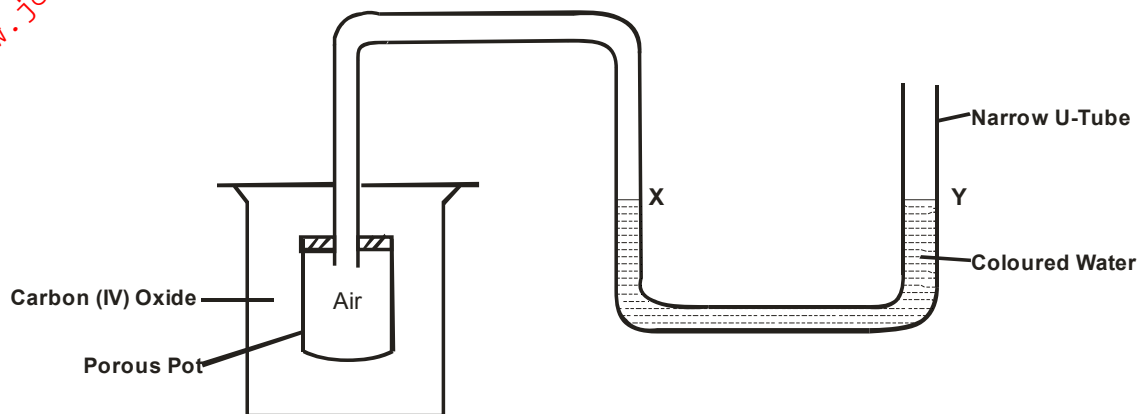
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8. In an experiment to study diffusion of gases a student set up the apparatus shown in the diagram.



I. State and explain the observation on the water level after sometime at point X and Y. (2 Marks)

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II. Suppose carbon (iv) oxide was replaced with hydrogen gas, state the observation on the U-tube. (1 Mark)

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9.

Solution	A	B	C	D
PH	2	7	11	14

Explain which solution is likely to be that of :-

I. Aluminium chloride. (1Mark)

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II. Calcium hydroxide. (1 Mark)

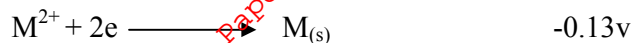
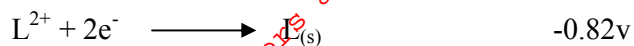
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III. Select a solution in which a sample of aluminium chloride is likely to dissolve. (1 Mark)

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10. Given that the electrode potentials of $L^{2+}_{(aq)}$ and $M^{2+}_{(aq)}$ are



Write the overall cell equation.

(1 Mark)

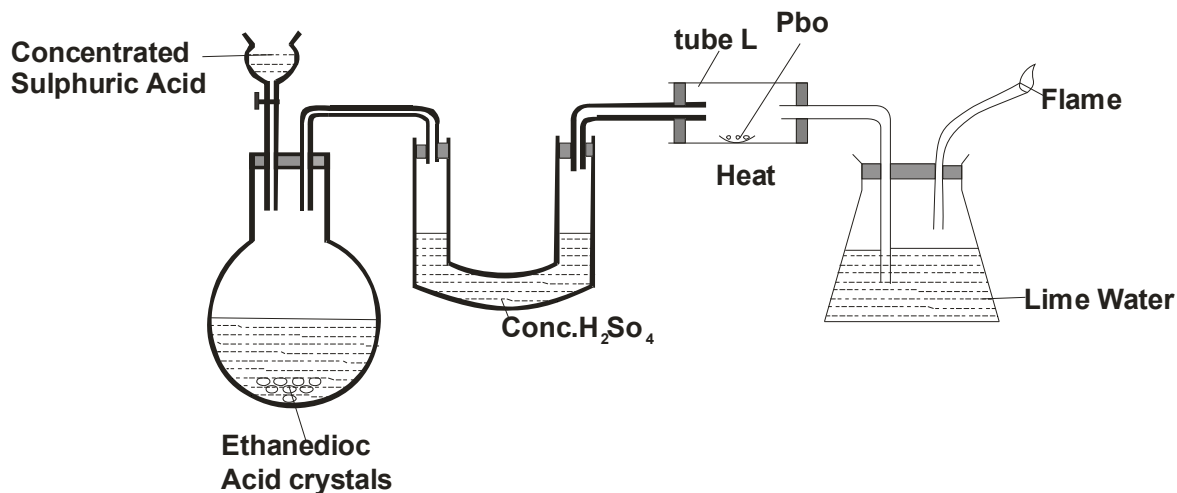
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Calculate the E° of the cell above.

(2 Marks)

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11. The apparatus below was set-up to prepare a gas R in the lab. Study it and answer the questions that follow.



a) Identify gas R.

(1 Mark)

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b) State the observation that was made in the combustion tube L at the end of the experiment.

(1Mark)

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c) Why is it necessary to burn the gas coming out of tube L?

(1 Mark)

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12. A solution contains 0.1M potassium carbonate solution. Were reacted with 100cm³ of 0.5M Hydrochloric acid. How many cm³ of the potassium carbonate solution would be used? (3 Marks)

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13. I) Hydrogen gas was passed over heated copper (II) oxide in a combustion tube. State and explain the observation made in the combustion tube. (2 Marks)

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- II) Name **two** other gases that can be used in place of hydrogen. (1 Mark)

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14. Iron is extracted from ore haematite.

The iron ore is put in a blast furnace with coke and a current of air is blown through the heated mixture.

- a) What do you understand by the term ore? (1 Mark)

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- b) What other raw materials needs to be added to the blast furnace? (1 Mark)

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- c) Near the bottom of the furnace, Iron (III) oxide is reduced by carbon. Write the equation for the reaction. (1 Mark)

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15. In a sample the percentage of O is 80% and O is 20%.

- a) Calculate the relative atomic mass of O. (2 Marks)

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- b) Explain why the two isotopes of O have the same chemical properties. (1 Mark)

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16. A student from Mbooni School was given two gas jar, one containing oxygen and the other Nitrogen (I) oxide.

- a) State **one** physical test he could perform to differentiate between the two gases. (1 Mark)

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- b) Calculate the mass of Nitrogen (I) oxide that would occupy the same volume as 16g of oxygen gas at the same temperature and pressure. (N=14, O=16) (2 Marks)

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17. Calculate the number of nitrate ions in 250.0cm³ of 1.0M solution of lead (II) nitrate. (Avogadro's constant 6.0×10^{23}) (3 Marks)

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18. a) Name **two** commonly abused drugs in Kenya. (2 Marks)

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- b) Differentiate between prescription drugs and over the counter drugs. (1 Mark)

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19. P, Q and R represents elements in the same group of the periodic table. The oxides of the elements are PO_2 , QO and RO_3 respectively. Use letters P, Q and R to answer the questions that follow.

a) What is the valency of each element in its oxide? (1½ Marks)

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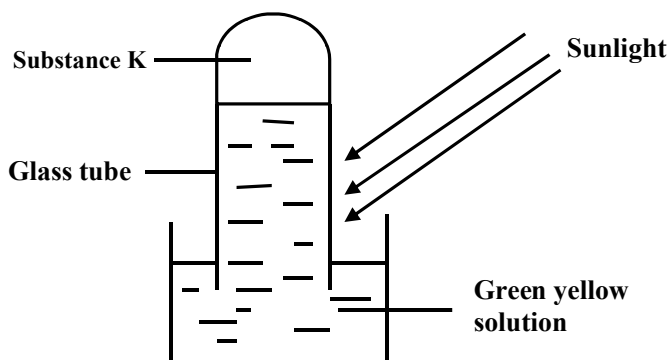
b) Write the formula of the compounds which the elements would form with hydrogen. (1½ Marks)

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20. Chloride gas was bubbled through water for some time. The green yellow solution formed was poured into a long glass tube and placed in the sun as shown below.



a) Write the formulae of the green yellow solution. (1 Mark)

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b) Write an equation to show how substance K is formed. (1 Mark)

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c) Write an Ionic equation for the reaction between chlorine and aqueous iron (II) chloride solution. (1 Mark)

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21. a) Complete the nuclear equation below.

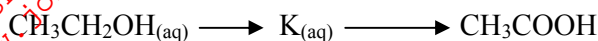


b) State one:-

i) Use of radioisotopes in agriculture. (1Mark)

ii) Danger associated with exposure of human beings to radioisotopes. (1 Mark)

22. The equation below shows the steps in preparation of ethanoic acid from ethanol. Study it and answer the questions that follow.



a) Identify K. (1Mark)

b) Identify the suitable reagent used in the above reaction. (1 Mark)

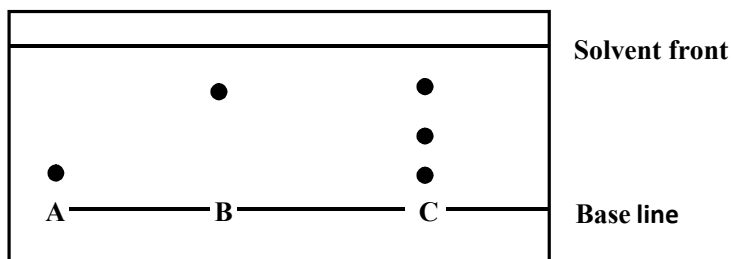
c) State the condition necessary for the above reaction to take place. (1 Mark)

23. a) Using dot (•) and cross (X), show bonding in H_2O and CO_2 (C=12, O=16, H=1). (2 Marks)

b) Why is H_2O a liquid at room temperature while CO_2 is a gas at room temperature. (1 Mark)

24. Describe how you would prepare a sample of Barium sulphate using the following reagents. Dilute sulphuric (vi) acid, dilute hydrochloric acid and Barium carbonate. (3 Marks)

25. The diagram below represents paper chromatography of substances A, B and C. Study it and answer the questions below.



a) Which substance is a mixture? Explain.

(2 Marks)

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b) Compare the solubilities of substance A and B in the solvent used.

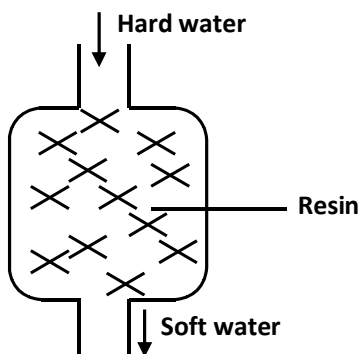
(1 Mark)

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26. The column below was used to soften hard water.



a) Explain how the hard water was softened as it passed through the column.

(2 Marks)

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b) Give **one** advantage of using hard water for domestic purposes.

(1 Mark)

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27. 20g of Zinc sulphate was reacted with excess sodium hydroxide solution in a double decomposition reaction.

i) Define double decomposition.

(1Mark)

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ii) Calculate the mass of precipitate formed.

(2 Marks)

(Zn=65, S=32, O=16, H=1)

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