Name …… **Index No**……

School …… **Candidate's Signature** ……

Date ……

233/1

CHEMISTRY

PAPER 1

JULY / AUGUST

(THEORY)

TIME : 2 HOURS

KITUI WEST DISTRICT JOINT EVALUATION TEST - 2011

Kenya Certificate of Secondary Education

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 - 28	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.

 Turn Over

1. Study the nuclear equation below to answer the questions that follow.

C ⟶ +

i) Identify particle Q. (1mark)

……

ii) Determine the values of N and M.

x (1mk)

……

Y (1mk)

……

2. Hydrogen Sulphide gas reacts with moist chlorine gas according to the equation below:

$H_2S_{(g)} + Cl_{2(g)} \longrightarrow S_{(s)} + HCl_{(g)}$

i) Which substance is the reducing agent? Explain. (3marks)

……

……

ii) State the observation made when this reaction occurs. (1mark)

……

3. 15.8g of Sodium nitrate saturated 29.3cm^3 of water at 32^{0}C. Determine the solubility of Sodium nitrate at 32^{0}C. (Density of water =1g/cm^3). (3marks)

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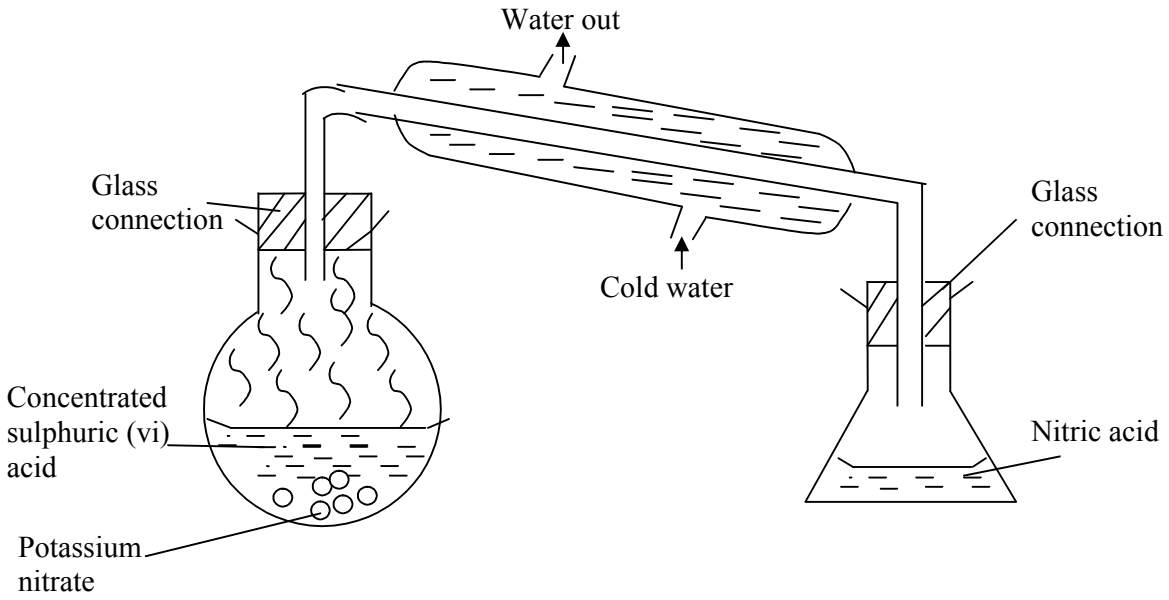
4. The apparatus below was used to prepare a sample of nitric acid in a laboratory.



i) Identify one mistake in the set-up. (1mark)

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ii) Why are all the apparatus made of glass? (1mark)

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……

iii) Why is cold water put from the bottom instead of from the top? (1mark)

……

……

5. Calculate the number of Sulphate ions in $100cm^3$ of 0.2m Aluminium Sulphate solution. ($L=6.02x10^{23}$ particles). (3marks)

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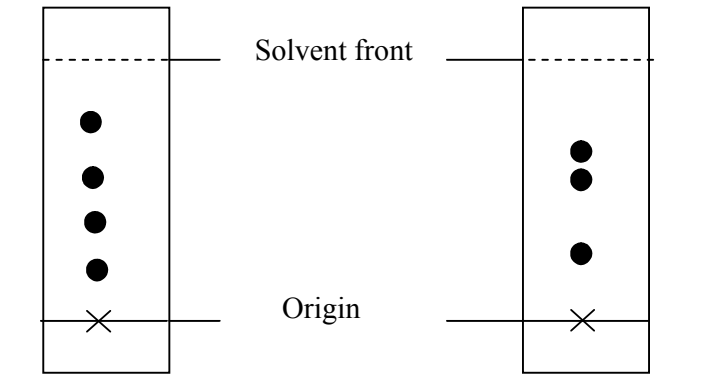
6. Complete the table below.

Metal	Main ore	Formula of main compound
Aluminium		
Copper		

(2mks)

7. Paper chromatography was carried out to investigate presence of amino acids in beans. Study the chromatograms below to answer the question that follow:-



What conclusion can be drawn from these results? (2marks)

……

8. Calculate the oxidation number of manganese in:

i) $KMnO_4$ (1mark)

……

……

……

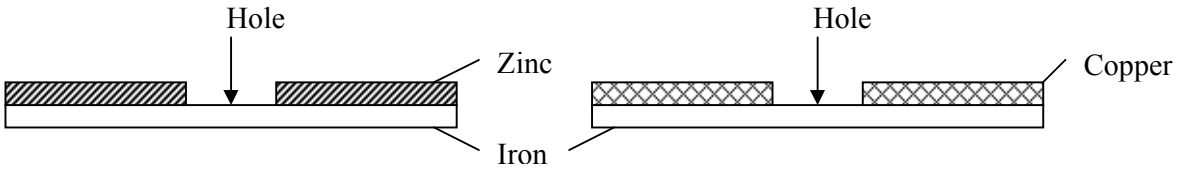
ii) $MnCl_2$ (1mark)

……

……

……

9. Below are cross-sections of two pieces coated with Zinc and Copper respectively.



Which piece would rust when the holes were filled with water and left for sometime? Explain .(2marks)

……

……

10. Name the following organic compounds.

i) $CH_3CH_2CH(CH_3)\ CH_3$ (1mark)

……

ii) CH_2CHCH_2Cl (1mark)

……

iii) $CH_2CH_2CH_2CH_{2n}$ (1mark)

……

11. Study the table below to answer the questions that follow.

Solution	X	W	Z	Y
P^H value	2.2	7.2	6.5	13.5

i) Which solution is likely to be:

I. Acid rain (1mark)

……

II. Potassium hydroxide (1mark)

……

ii) A substance U reacted with both solutions X and Y

What is the nature of substance U? (1mark)

……

12. i) The percentage of X is 60% and X is 40% for an isotopic element X. Calculate the relative atomic mass of X. (2marks)

……

……

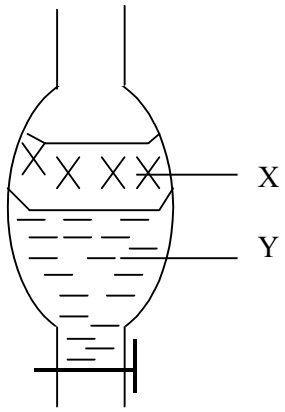
……

ii) Why do the two species have the same chemical properties? (1mark)

……

……

13. In separating a mixture of iodine and Sodium Chloride a student added water and Carbon tetrachloride to the mixture, stirred and poured the contents in a separating funnel shown below.



i) What is the purpose of adding Carbon tetrachloride? (1mark)

……

ii) Name the major components of the layer labeled Y. (1mark)

……

14. Explain why the electrical conductivity of metals decrease with increase in temperature. (2marks)

……

……

15. Calculate the amount of Calcium Carbonate that would remain if 17.0g of Calcium Carbonate are reacted with 0.25moles of dilute hydrochloric acid. (Ca=40, C=12, O=16). (3mks)

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16. Chlorine gas was bubbled through a solution of Potassium iodine in a boiling tube.

i) State the observations that were made. (1mark)

……

ii) Name the oxidizing agent in the reaction. Explain. (2marks)

……

……

17. Name the cations and anions responsible for permanent hardness of water.

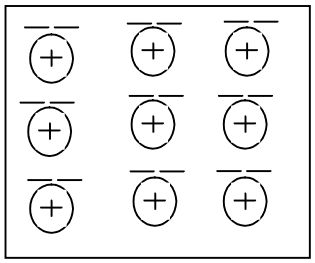
i) Cations (1mark)

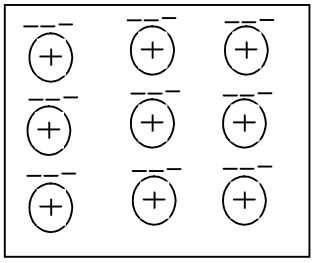
……

ii) Anions (1mark)

……

18. The structures below are sections of models of the structures of elements P and Q.





Key

⊕ Charged nucleus

— An electron

i) In which group of the periodic table do the elements belong?

I. P (1mark)

……

II. Q (1mark)

……

ii) Which of the two elements is a better conductor of electricity? Explain. (1mark)

……

……

19. Use the information below to answer the questions that follow.

$KCl_{(s)} \longrightarrow K^+_{(g)} + Cl^-_{(g)}; \quad \Delta H_1 = -701KJMol^{-1}$

$KCl_{(s)} \longrightarrow K^+_{(ag)} + Cl^-_{(aq)}; \quad \Delta H_2 = +5KJMol^{-1}$

i) What name is given to ΔH_1? (1mark)

……

ii) Calculate the heat change for the process: (2marks)

$K^+_{(g)} + Cl^-_{(g)} \longrightarrow K^+_{(aq)} + Cl^-_{(aq)}; \Delta H_3$(2mks)

……

……

……

20. When bromine gas reacts with aqueous Sodium hydroxide the equilibrium is established as shown below:

$$Br_{2(g)} + 2OH^-_{(aq)} \longleftrightarrow Br^-_{(aq)} + OBr^-_{(aq)} + H_2O_{(l)}$$

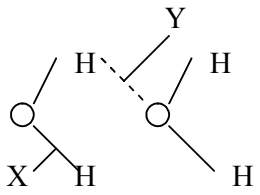
(Brown) (colourless)

State and explain the observations that would be made if a few drops of dilute Sulphuric (VI) acid were added. (2marks)

……

……

21. The structure of two molecules of water can be represented as shown below.



i) Name the type of bonds X and Y

I. X…….. (1mark)

II. Y……. (1mark)

ii) The table below gives some information about water and Methane.

Substance	Relative molecular mass	Boiling point (^{0}C)
Water	18	100
Methane	16	-161

Explain the difference between the boiling points of water and methane. (1mark)

……

……

22. Name the process that takes place when:

i) Fats or oils are hydrolysed using an alkali (1mark)

……

ii) A heavy nuclide is broken by fast moving neutron. (1mark)

……

iii) Sulphur is heated with natural rubber. (1mark)

……

23. Starting with Zinc metal describe how you would obtain a sample of solid zinc carbonate. (3marks)

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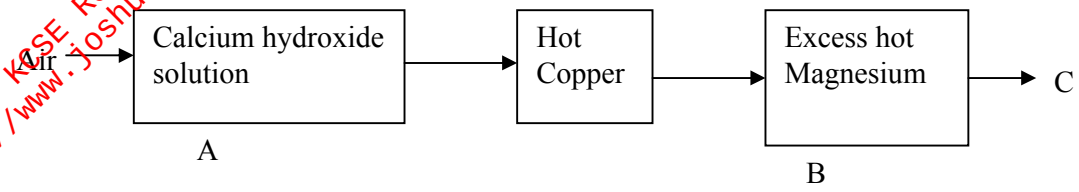
24. Air was passed through reagents as shown below.



i) State and explain the observations made when air is passed through chamber A for a long time.

(2marks)

……

……

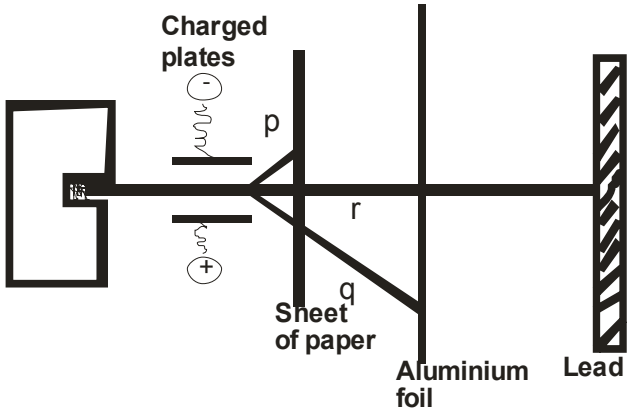
……

ii) Name one component in C. Explain (1mark)

……

……

25. Study the diagram below to answer the questions that follow.



Name the radiations p, q and r

i) p …… (1mark)

ii) q…… (1mark)

iii) r…….... (1mark)

26. i) State the law of combining volumes of gases (1mark)

……

……

……

ii) What volume of methane would remain if a burner containing $40cm^3$ of methane gas burns in $40cm^3$ of enclosed air? (Assume oxygen is 20% by volume of air). (2marks)

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27. Why does a luminous flame produce light and soot? (3marks)

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28. 1.7g of ammonia gas was passed over excess heated Copper (Ii) oxide at s.t.p. Calculate the volume of ammonia gas that reacted. (N=1.4, H=1, molar gas volume at s.t.p $=22.4dm^3$) (3marks)

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