Name……. **Index No……/…….**

School…… **Date ……..…**

Candidate's Signature…….

233/1
CHEMISTRY
Paper 1
(Theory)
July/August - 2012
Time: 2 Hour

MBITA- SUBA DISTRICTS JOINT EVALUATION TEST– 2012

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

233/1
CHEMISTRY
Paper 1
July/August - 2012
2 Hours

INSTRUCTIONS TO CANDIDATES

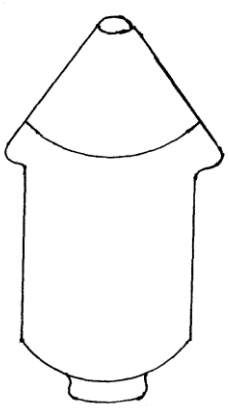
1. Write your name and index numbers in the space provided above.
2. Sign and write the date of examination in the space provided above.
3. Answers all the questions in the spaces provided in the question paper.
4. Mathematics tables and silent electronic calculators maybe used.
5. All working **MUST** be clearly shown where necessary.
6. This paper consists of 14 printed pages. Candidates should confirm the 14 printed pages are there.

FOR EXAMINER USE ONLY

QUESTION	MAXIMUM SCORE	CANDIDATES SCORE
1- 29	80	

This paper consists of 12 printed pages.
Candidates should check the question paper to ensure that all pages are printed as indicated and no questions are missing

1. Study the apparatus shown below and answer the questions that follow



(a) Name the apparatus (1mk)

……

(b) Give its use (1mk)

……

……

2. The table below gives some properties of chloride of period three elementsA ,Band C .Study it and answer the questions the questions that follow.

Chloride of element	Melting point	Boiling point
A	-101	-35
B	714	1407
C	-7	60

(a) Name the type of bond that most likely exists in the chloride of A (1mk)

……

(b) What type of bond exists in chloride of element B. (1mk)

……

3. Study the information represented in the table below and answers the questions that follows

Element	Atomic radii(nm)	Ionic radii(nm)
P	0.153	0.185
Q	0.184	0.211
R	0.230	0.260
S	0.260	0.305

(a) Would the element form part of a period or group. Explain (2mks)

……

……

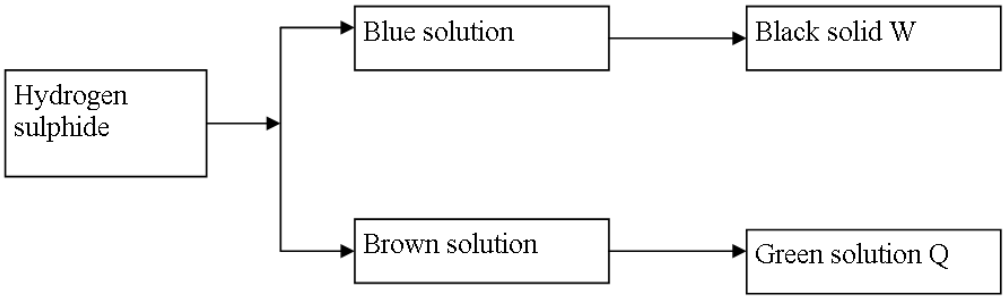
……

(b) Which one is the most reactive element? (1mk)

……

4. When $Na_2Co_3.XH_2O$ is heated strongly it losses 63.20% of mass. Calculate the value of X. (Na=23.0, C=12.0,O=16.0,H=1.0) (2mks)

5. Hydrogen sulphide gas is bubbled into two solutions of metallic nitrate as represented in the flow chart below.



(a) Identify the cation present in

I. Blue solution (1mk)

……

II Brown solution (1mk)

……

(b) Write an ionic equation for the formation of green solution Q (1mk)

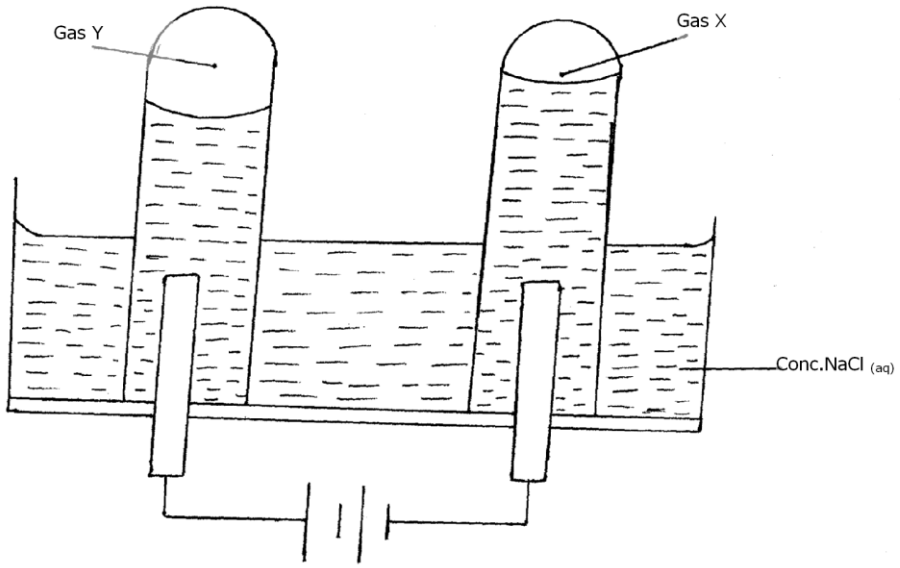
6. M grams of radioactive isotope decayed to 5 grams in 100 days. The half life of the isotope in 25 days.

(a) What is meant by half-life (1mk)

……

(b) Calculate the initial mass M of the radioactive isotope (2mks

7. The set up below was used to electrolysed a concentration sodium chloride solution



(a) Name

(i) Gas Y (1mk)

……

(ii) Gax X (1mk)

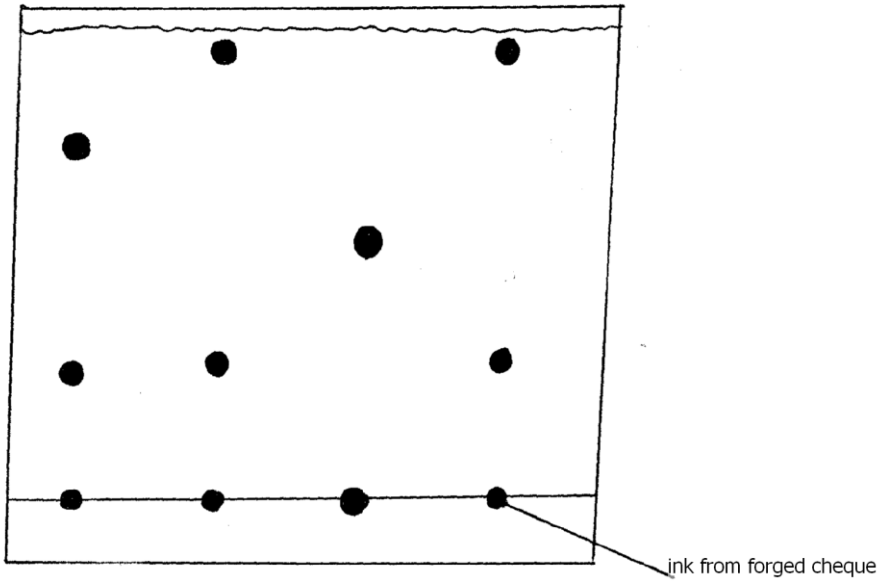
……

(b) What is the laboratory test for gas X (1mk)

……

……

8. Ink is taken from the signature of a forged cheque and compared with ink from pens of three suspects A, B and C. Using paper chromatography. The results is shown below



(a) Describe how a sample of ink was taken from the forged cheque (2mks)

……

……

……

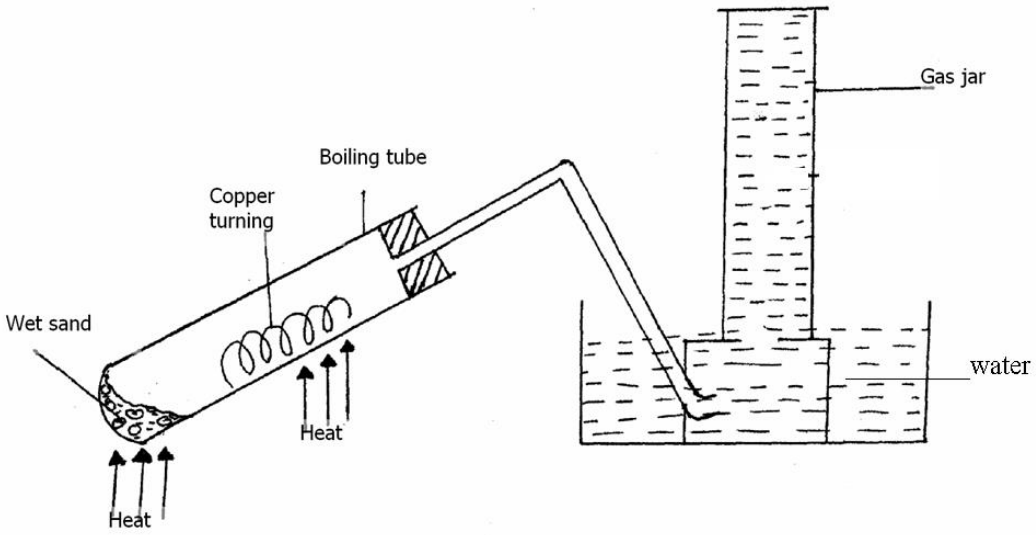
(b) Which suspect could not be guilty?

……

……

……

9. The set-up below was used to investigate the effect of steam on copper turnings



(a) What was observed in the oiling tube? Explain (2mks)

……

……

(b) Suggest one other metal that would behave as copper turnings in the above set up if used. (1mk)

……

10. 5.04g of a mixture of anhydrous sodium carbonate and sodium hydrogen when heated to a constant mass gave 4.11g of residue.

(a) Write an equation for the reaction that takes place when the mixture is heated (1mk)

(b) Calculate the percentage of anhydrous sodium carbonate in the mixture (2mks)

11. The products formed by action of heat on nitrates of element A, B and C are shown below

Nitrate	Products formed
A	Metal oxide +Nitrogen (IV) Oxide + Oxygen
B	Metal +Oxygen (IV) Oxide
C	Metal nitrate + oxygen

(a) Arrange the metals in order of reactivity (1mk)

(b) Which element forms a soluble carbonate (1mk)

……

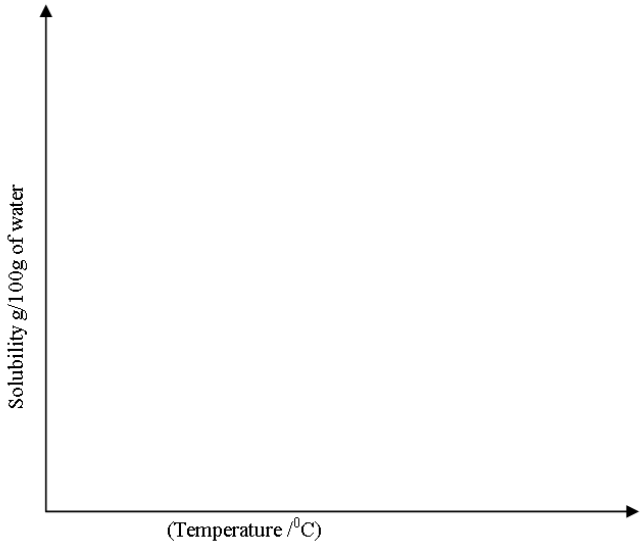
(c) Give an example of B (1mk)

……

12. Complete the table below

Species	Atomic mass	Number of neutrons	Number of electrons	Number of protons
V3+	27			13
Q2-		8		8

13. The curve below represents solubility of potassium nitrate



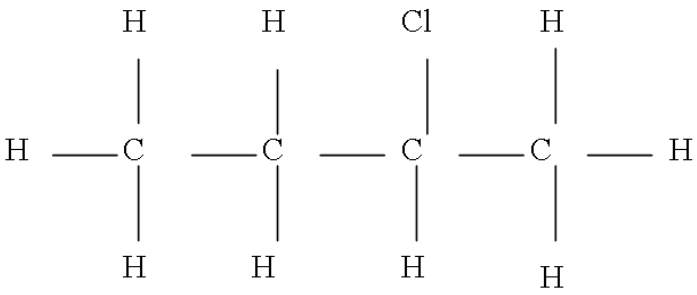
(a) On the same axis, sketch a curve to show solubility of hydrogen sulphide gas.
Explain the shape of your curve (2mks)

……

……

……

14. One mole of hydrogen gas reacts with an organic compound R to give a simple product with structural formula shown below



(a) Give the name of the product (1mk)

……

(b) Draw the structural formula of compound R. (1mk)

……

(c) To which homologous series does compound R belong? (1mk)

……

15. (a) What is meant by the term enthalpy of neutralization (1mk)

……

(b) Calculate the enthalpy of neutralization of sodium hydroxide(S.H.C=4.2j/g,density)

(2mks)

16. Study the information in the table below and answer the questions that follow.The letters are not actual symbols of the element.

Substance	Solubility in water	Electrical conductivity	
		solid	molten
K	Insoluble	Good	Good
L	Soluble	Poor	Good
M	insoluble	poor	poor

(a) Which of the substance is likely to be sodium chloride (1mk)

……

(b) What type of bond exists in substance K. (1mk)

……

17. Complete the table below

Indicator	Colour in	
	$H^+_{(aq)}$	$OH^-_{(aq)}$
phenolphthalein		
Melthy orange		

18. Using an ionic equation , state and explain the observations made when chlorine gas is bulled in a solution of potassium bromide. (3mks)

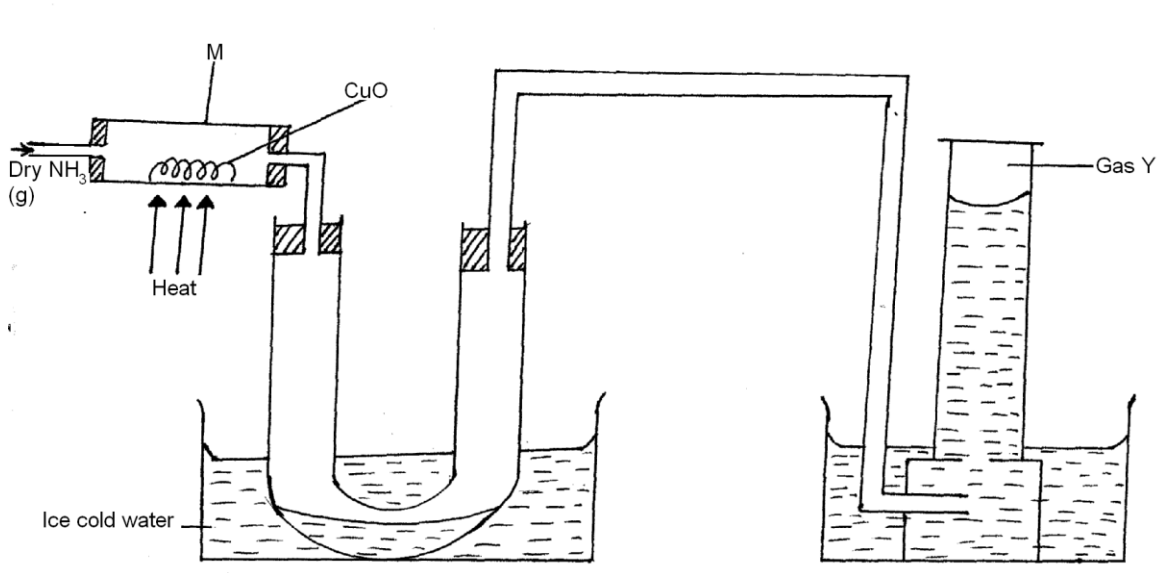
……

……

……

……

19. Dry ammonia gas was passed over heated copper (II) oxide as shown below



(a) State one observation made in tube M. (1mk)

……

(b) Name a suitable drying agent for ammonia gas (1mk)

……

(c) Identify gas Y (1mk)

……

20. In the last stage of the solvary process, a mixture of sodium hydrogen carbonate and ammonia chloride is formed.

(i) State the method of separation used. (1mk)

……

(ii) Write an equation showing how lime is slaked

(iii) Name the by-products recycled in the above process (1mk)

……

21. Consider the chromote (VI) /dichromate (VI) equilibrium system described by the ionic equation below.

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

Yellow Orange

(a) What is meant by equilibrium system (1mk)

……

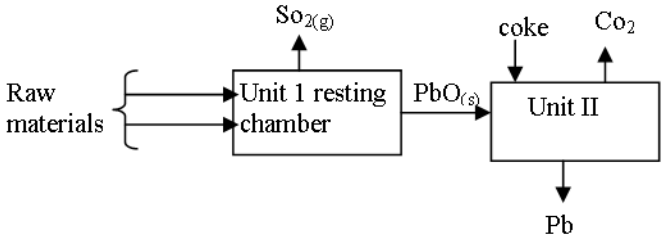
……

(b) What observation would be made when $NaOH_{(aq)}$ solution is added to the mixture above? Explain (2mks)

……

……

22. The flow chart below shows some process involved in extraction in extraction of lead metal. Study it and answer the questions that follow



(a) Name the two raw materials that were fed into unit I (2mks)

……

……

(b) State one environmental hazard associated with the process I unit I (1mk)

……

23. Polyphenylethene is a synthetic polymer

(i) Draw a unit structure of polyphenylethene

(ii) What type of polymerization takes place during the formation of polyphenylthene (1mk)

……

(iii) State one disadvantage of synthetic polymer over natural polymers (1mk)

……

24. Below is the redox reaction that takes place when manganese (IV) oxide reacts with dilute hydrochloric acid to liberate chloride gas

$MnO_{2(s)} + 4HCl_{(aq)} \longrightarrow MnCl_{2(aq)} + 2H_2O_{(l)} + Cl_{2(g)}$

(a) Explain using oxidation number which species is reduced (1mk)

……

(b) State one other reagent that can be used to separate chloride gas using concentrated hydrochloric acid other than manganese (IV) Oxide (1mk)

……

(c) Other than water treatment, state one other use of chlorine (1mk)

……

25. State and explain the observation that would be made when zinc powder is heated with copper (II) oxide (2mks)

……

……

……

26. (a) State Graham's law of diffusion (1mk)

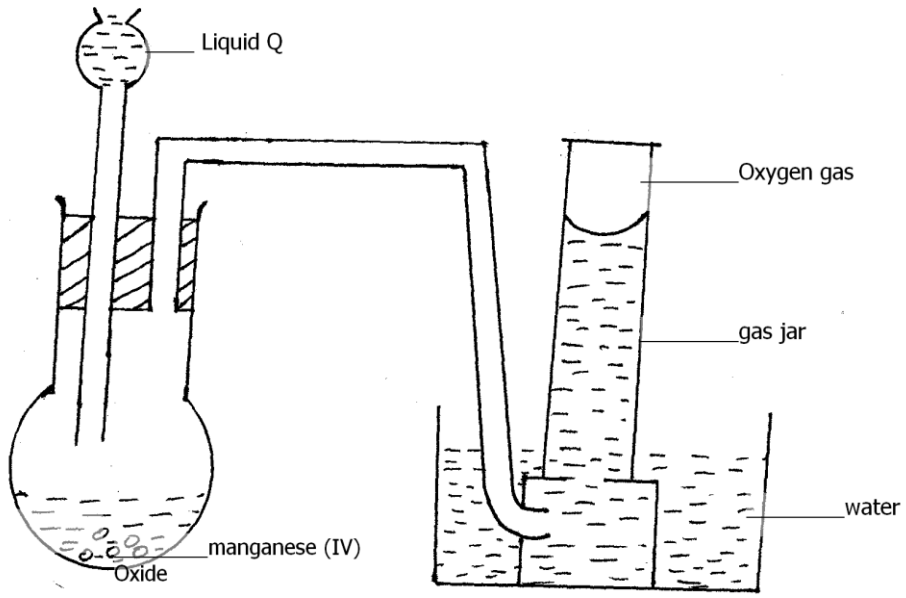
……

……

……

(b) A certain volume of gas S takes 180 seconds to diffuse through a porous plug.molar mass of S is 18g.Equal volume of gas Q takes 240 seconds to diffuse through the same plug. Calculate the molar mass of Q. (2mks)

27. A student set-up the apparatus shown below attempting to collect oxygen gas.



(a) State one mistake the student made (1mk)

……

(b) Identify liquid Q (1mk)

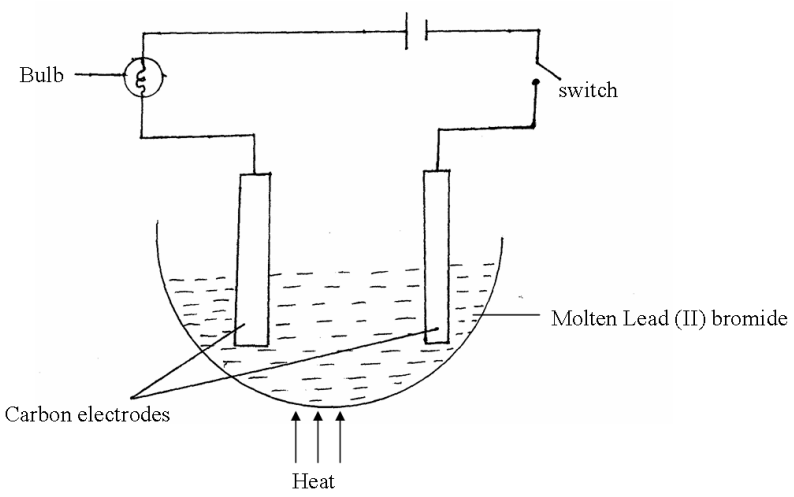
……

(c) What property enables the gas to be collected as shown above (1mk)

……

……

28. Study the set-up below and answer the questions that follows



(a) State and explain the observation made when the circuit is completed.

……

……

(b) What precautions should be taken when performing this experiment? Give a reason(1mk)

……

……

29. Calcium nitrate is a nitrogenous fertilizer. Calculate the percentage of nitrogen in the fertilizer (N=14.0,Ca=40.0,O=16.0) (2mks)