Name ……..…… Index No…….……

School ……..…….... Candidate's Signature ……

Date …….....……..

233/2
CHEMISTRY
PAPER 2
(THEORY)
JULY/ AUGUST
TIME: 2 HOURS

KITUI WEST DISTRICT JOINT EVALUATION TEST - 2011

Kenya Certificate of Secondary Education

233/2
CHEMISTRY
PAPER 2
(THEORY)
TIME: 2 HOURS

INSTRUCTIONS:

- Write your name and index number in spaces provided above
- Answer **ALL** the questions in the spaces provided
- Mathematical tables and electronic calculators may be used
- All working must be clearly shown where necessary.

FOR EXAMINERS USE ONLY

Question	Maximum Score	Candidates score
1	10	
2	11	
3	10	
4	12	
5	12	
6	13	
7	12	
TOTAL SCORE	**80**	

This paper consists of 9 printed pages.
Candidates should check to ensure that all pages are printed as indicated and no questions are missing

1. The table below shows some information about elements X,Y,W and Z. The letters are not the actual symbols of the elements.

Element	Electron arrangement	Ion	Valency	Oxidation number
X	2.3			
Y	2.8.2			
W	2.7			
Z	2.5			

i) Complete the table by filling the missing information. (6marks)

ii) Which elements belong to the same period? Explain your answer. (2marks)

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iii) Name two elements that would conduct an electronic current. Explain your answer. (2marks)

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iv) Which of the elements in (iii) is a better conductor of electricity? Give a reason. (2marks)

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v) Draw a dot (•) and cross (x) diagram to show the bonding in a compound formed between W and Z. (2marks)

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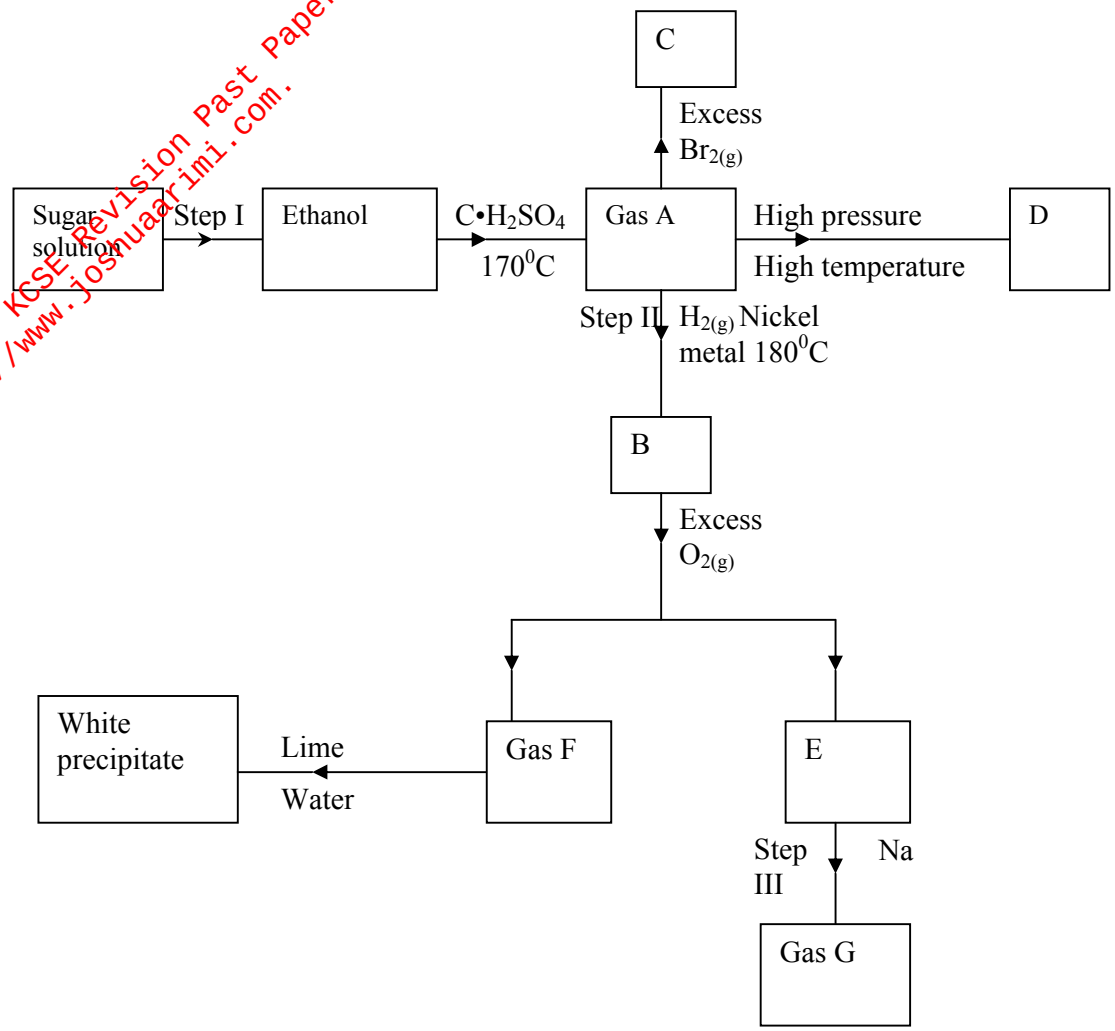
2. Study the flow chart below to answer the questions that follow.



i) What name is given to the process in stepI? (1mark)

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ii) Name the substances A, B, F and G.

I. A (1mark)

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II. B (1mark)

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III.F (1mark)

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IV.G (1mark)

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iii) Write the equation for the formation of:

I. C (1mark)

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II.E and F (1mark)

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III. Gas G (1mark)

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iv) What is the environmental effect of continued use of substance D? Explain your answer. (2marks)

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v) Name the white precipitate? (1mark)

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vi) What is the importance of the reaction in steps II in industry? (1mk)

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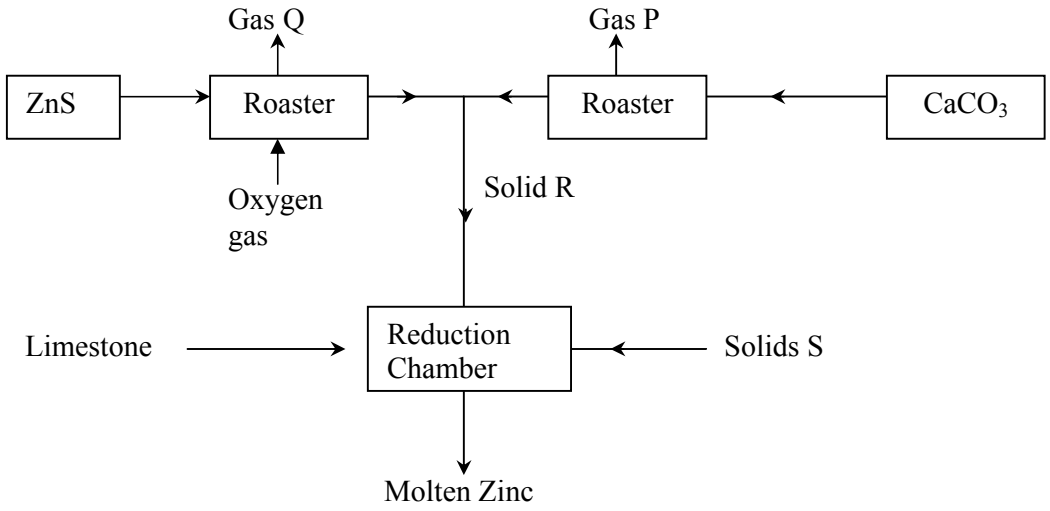
3. The flow chart below shows the extraction of Zinc from two ores. Study it to answer the questions that follow.



i) Give the common names of the ores:

I. ZnS……..(1mark)

II. $CaCO_3$……(1mark)

ii) Name the gases P and Q

I. P……(1mark)

II. Q……(1mark)

iii) Name the solids R and S.

I. R……..(1mark)

II. S……(1mark)

iv) Write a chemical equation for the reaction that produces Zinc metal. (1mark)

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v) What is the purpose of adding limestone in the reduction chamber? (1mark)

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vi) Give two uses of Zinc metal (2marks)

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vii) Name two other industries that can be established alongside the zinc extraction plant. (2mks)

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4. a) Study the standard reduction potentials given below to answer the questions that follow. The letters are not the actual symbols of the elements.

		$E^{\emptyset}$(Volts)
$F_2(aq) + 2e^- \longrightarrow 2F^-(aq)$	;	+0.54
$A^{2+}(aq) + 2e^- \longrightarrow A(s)$	;	-0.45
$B^{2+}(aq) + 2e^- \longrightarrow B(s)$	;	+0.34
$2C^+(aq) + 2e^- \longrightarrow C_2(g)$	;	0.00

i) Identify the strongest reducing agent. (1mark)

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ii) Which element is likely to be hydrogen? Explain (2marks)

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iii) Write an equation for the reaction which takes place when solid A is added to a solution containing B^{2+} ions (1mark)

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iv) Calculate the $E^{\emptyset}$ value for the reaction in (iii) above. (2marks)

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v) Draw a labeled diagram of the electrochemical cell that would be obtained in (iv) above (3marks)

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b (i) What is meant by an electrolyte? (1marks)

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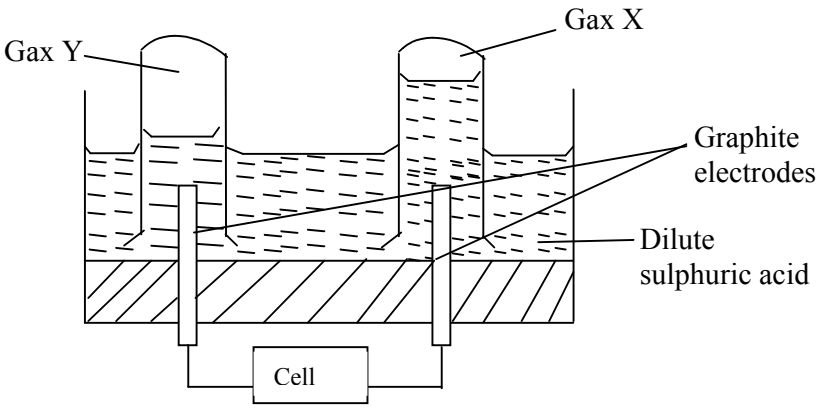
ii) The diagram below shows the apparatus that can be used to electrolyse dilute Sulphuric acid. Study it to answer the questions that follow.



I. Identify the gases X and Y

a) X (1mark)

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b) Y (1mark)

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II. What happens to the concentration of the Sulphuric acid during the process with time? Explain (2marks)

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III. During the electrolysis a current of 0.72A was passed through the electrolyte for 15 minutes. Calculate the volume of gas X produced

(1 Faraday = 96,500c, molar gas volume = 24dm3 at r.t.p). (3marks)

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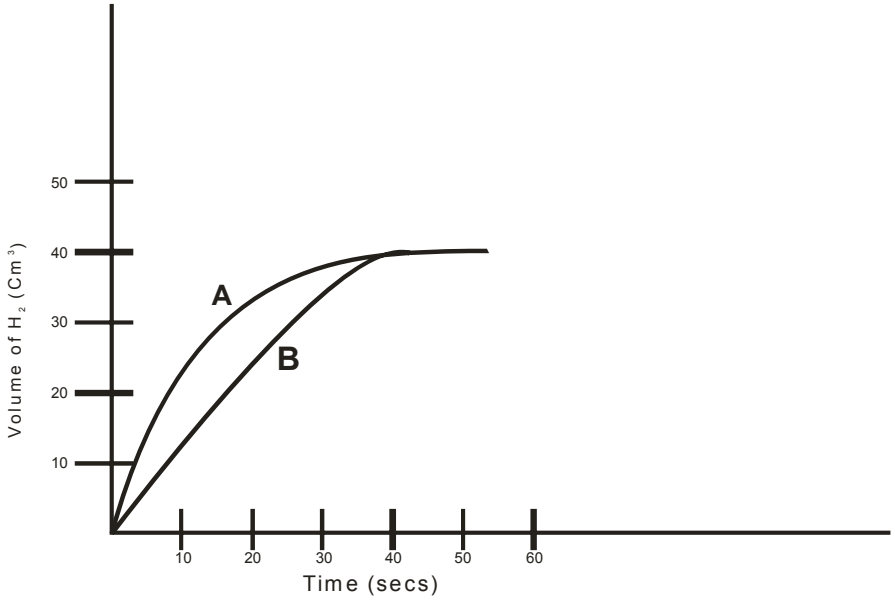
5. In an experiment to investigate the rate of reaction, 0.1g of a piece of magnesium was allowed to react with excess 1.0m hydrochloric acid. The results were used to draw a graph. The same experiment was repeated with 2.0m hydrochloric acid and a graph drawn. The results are shown in the graph below.



i) Which curve was obtained using 2m hydrochloric acid? Explain (2marks)

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ii) Explain why the curves become horizontal where they meet. (1mark)

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iii) Determine the number of moles of hydrogen gas that would be produced in the reaction. (Mg=24, H=1, Molar gas volume is $24dm^3$). (3mks)

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iv) Explain how the rate of reaction would be affected if the mixture is warmed. (2marks)

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v) Explain why nitric acid is not used in preparing hydrogen gas. (2marks)

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vi) State one industrial use of hydrogen gas. (1mark)

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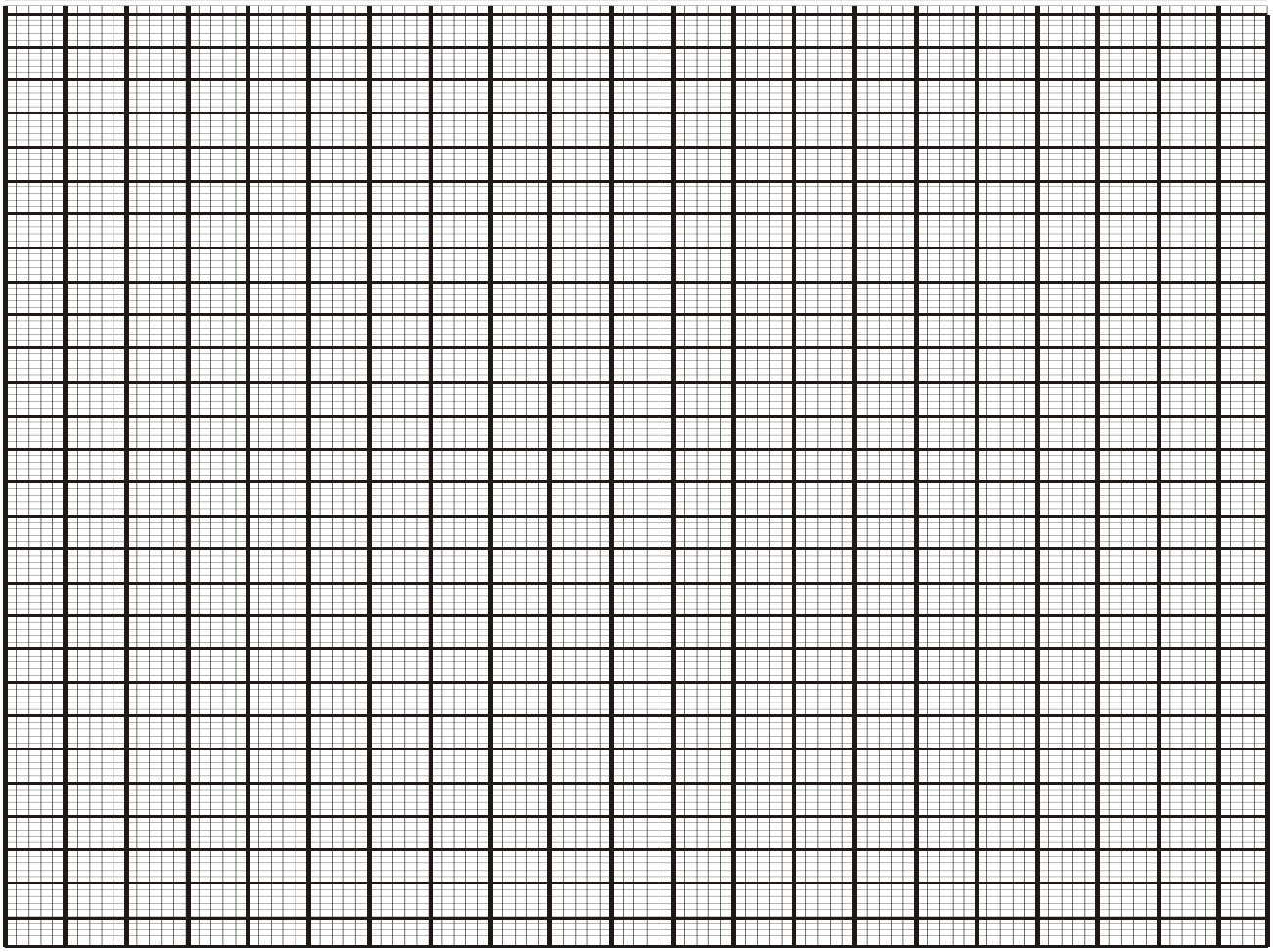
6. An experiment was done between lead (II) nitrate solution and Potassium iodine solution. $10cm^3$ of 0.4M Potassium iodide solution was put in 10test-tubes and different volumes of 0.25M lead (II) nitrate added to the different test-tubes. A yellow precipitate and a colourless solution were formed each time. The table below gives the results obtained in each case.

Height of precipitate (mm)	5	10	15	20	25	30	35	39	39	39
Volume of lead(II) nitrate (cm^3)	1	2	3	4	5	6	7	8	9	9

i) Draw a graph of height of precipitate (y-axis) against volume of lead (ii) nitrate solution added.

(1mark)



ii) Name the precipitate formed during the experiment. (1mark)

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iii) From the graph, determine the height of precipitate when 5.4cm^3 of lead (II) nitrate solution is added. (1mark)

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iv) What volume of Lead (II) nitrate solution is required for complete reaction? Explain (2marks)

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v) Determine the number of moles of Potassium iodide solution used. (2marks)

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vi) Calculate the number of moles of lead (II) nitrate solution that reacted. (2marks)

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vii) Write an ionic equation for the reaction between lead (II) nitrate solution and Potassium iodide solution (3marks)

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