Name …….. **Index No……...../……..**

School…….. **Candidate's sign……**

Date……

233/1

CHEMISTRY

(THEORY)

PAPER 1

JULY/AUGUST 2009

2 Hours

MANGA DISTRICT JOINT EVALUATION TEST - 2009

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

233/1
CHEMISTRY
(THEORY)
PAPER 1
JULY/AUGUST 2009
2 Hours

INSTRUCTIONS

1. **Write your name and index number in the spaces provided.**
2. **Sign and write the date of examination in the spaces provided.**
3. **Answer ALL questions in the spaces provided**
4. **Mathematical tables and electronic calculators nay be used.**
5. **All working MUST be shown clearly where necessary.**

FOR EXAMINERS USE ONLY

questions	Maximum score	Candidate's score
1-28	80	

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

1. Name the particles responsible for the electrical conductivity of:

(a) Graphite. (1mk)

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(b) Magnesium Sulphate solution (1mk)

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2. (a) What is the meaning of PH? (1mk)

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(b) Define the following in terms of PH:

(i) An acid (1mk)

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(ii) A base (1mk)

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3. When lead(II)Carbonate is reacted with dilute sulphuric(VI)acid, the reaction takes place for a short time and then stops. Explain. (2mks)

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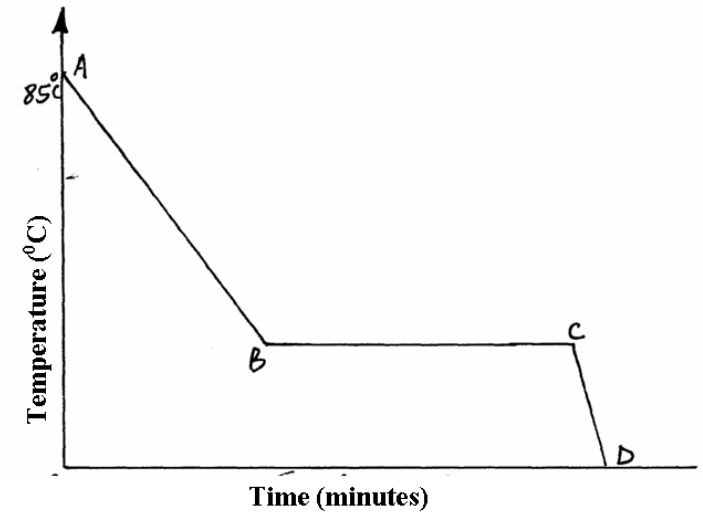
4. A Student in form four placed a thermometer in molten naphthalene at 85^0C and recorded the temperature and time until the naphthalene solidified. From the values obtained, the figure below was drawn.



(a) What name is given to such a figure? (1mk)

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(b) Which part of the figure represents the change of state of naphthalene? (1mk)

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(c) In terms of kinetic theory. Explain what happens to molecules along AB. (1mk)

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5. The table below shows information about three solid substances A, B and C. Study it and answer the question that follow.

Solid	Cold water	Hot water
A	Soluble	Soluble
B	Insoluble	Insoluble
C	Insoluble	Soluble

Describe how you will separate the three solids from a mixture of the three. (3mks)

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6. A gas, G is prepared in the laboratory by adding concentrated sulphuric(VI)acid to a compound C. Gas G is denser than air and dissolves in water to form a solution which is strongly acidic.

(a) Name two gases that are most likely to be G. (2mks)

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……

(b) Draw a diagram to show how gas G can be collected. (1mk)

7. $25.0cm^3$ of 0.12M potassium hydroxide solution required $30.0cm^3$ of a solution of a dibasic acid (H_2Y) for complete neutralization. The acid contained 3.15g per $500cm^3$ solution.
Calculate:

(a) The molarity of the acid solution (1½mks)

(b) The relative formula mass of the acid. (1½mks)

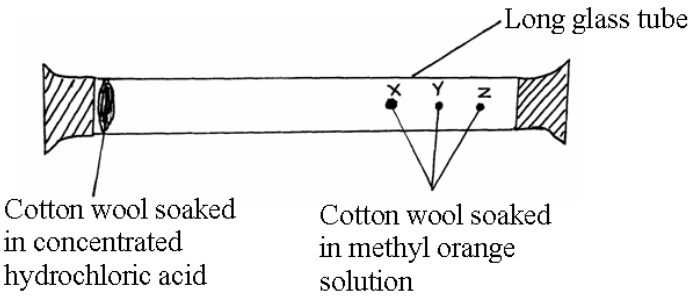
8. 10.0g of ethanol (C_2H_5OH) were completely burnt in air. The heat evolved caused the temperature of $400cm^3$ of water to rise from 22^0C to 87^0C. Calculate the molar heat of combustion of ethanol (H=1, C=12, O=16, specific heat capacity of water = 4.2 $kJkg^{-1}k^{-1}$; Density of water = $1gcm^{-3}$)
(3mks)

9. Determine the oxidation number of

(a) Manganese in $KMnO_4$ (1mk)

(b) Sulphur in Na_2SO_3 (1mk)

10. Study the set-up below and answer the questions that follow.



After sometimes, the cotton wools X, Y and Z changed colour in turn.

(a) What were the colour changes? (1mk)

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……

(b) Which cotton wool changed colour first? (½ mk)

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(c) Explain why the cotton wools did not change colour at the same time. (1 ½ mks)

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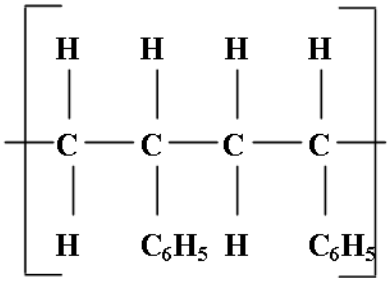
11. The following is a small section of polystyrene polymer. Study it and answer the questions that follow.



(a) Drarw the structure of the monomer unit of polystyrene. (1mk)

(b) Calculate the number of monomers used to form the polystyrene polymer of relative molecular mass of 18,096. (H=I=, C=12) (2mks)

12. Name the method of separation that can most suitably be used to separate the following mixtures.

(a) Gasoline from petroleum (1mk)

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(b) Benzoic acid and potassium carbonate (1mk)

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(c) Oil from cashew nuts (1mk)

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13. An aqueous solution of ammonia was added drop wise to a solution of copper (II) Sulphate until in excess.

(a) State the observation made when:-

(i) A few drops of aqueous ammonia were added. (1mk)

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(ii) Excess aqueous ammonia was added. (1mk)

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(b) Write the formula of the complex ion responsible for the observation made in a(ii) above (1mk)

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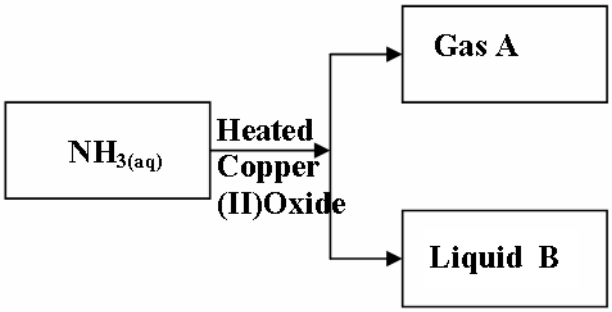
14. Study the flow chart below and answer the questions that follow.



(a) State the observation made when ammonia gas is passed over heated copper(II)oxide. (1mk)

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(b) Identify:

(i) Gas A (1mk)

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(ii) Liquid B (1mk)

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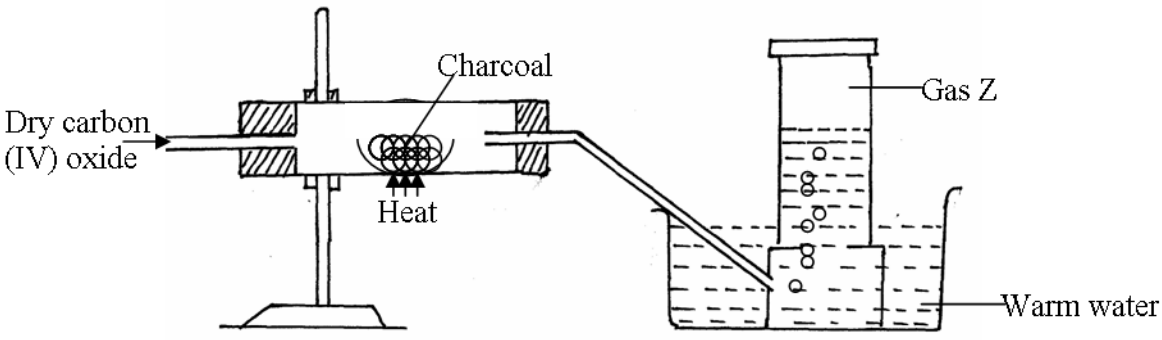
15. Study the diagram below and answer the questions that follow.



(a) Identify gas Z. (1mk)

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(b) Write the chemical equation for the reaction which produces gas Z (1mk)

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(c) State why the above experiment should be carried out in a fume chamber. (1mk)

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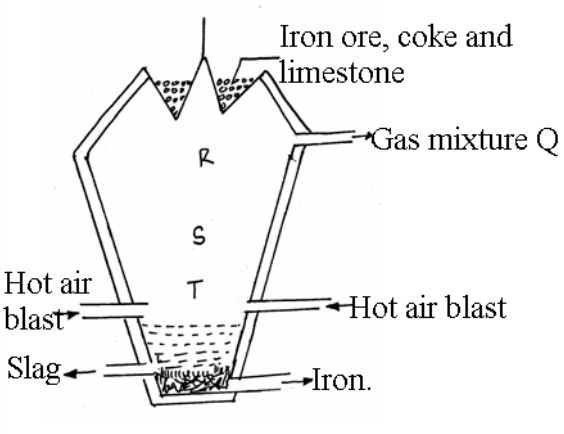
16. The diagram below shows the blast furnace for the extraction of iron. Study it and answer the question that follow.



(a) Name any one ore from which iron can be extracted. (1mk)

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(b) At which point R, S or T in the blast furnace is the temperature lowest? (½ mk)

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(c) Name any one of the main gases in gas mixture Q (½ mk)

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(d) What is the function of the hot air blast? (1mk)

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17. An element E has relative atomic mass of 69.39. Given that the element has two isotopes of atomic masses 60.15 and 70.15, calculate the relative abundance of each of the isotopes. (3mks)

18. Briefly explain the following

(a) Atomic radii of alkaline earth metals are smaller than those of the corresponding alkali metals in the same period. (1mk)

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(b) Melting point of halogens increase down the group. (1mk)

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(c) Helium is a better gas for use in weather research balloons than hydrogen. (1mk)

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19. The table below shows elements W, X, Y and Z and their atomic numbers. The letters are not the actual symbols of the elements. Use the letters to answer the questions that follow.

Element	Atomic number.
W	16
X	11
Y	18
Z	12

(a) Select an element which forms

(i) Anions. (1mk)

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……

(ii) An insoluble carbonate. (1mk)

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(b) Which element has the largest atomic radius (1mk)

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20. Name the catalyst used in each of the following processes.

(a) Hydrogenation. (1mk)

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(b) Haber process. (1mk)

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……

(c) Contact process. (1mk)

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21. (a) What is meant by "rate of reaction"? (1mk)

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……

(b) State any two factors which affect the rate of a chemical reaction. (2mks)

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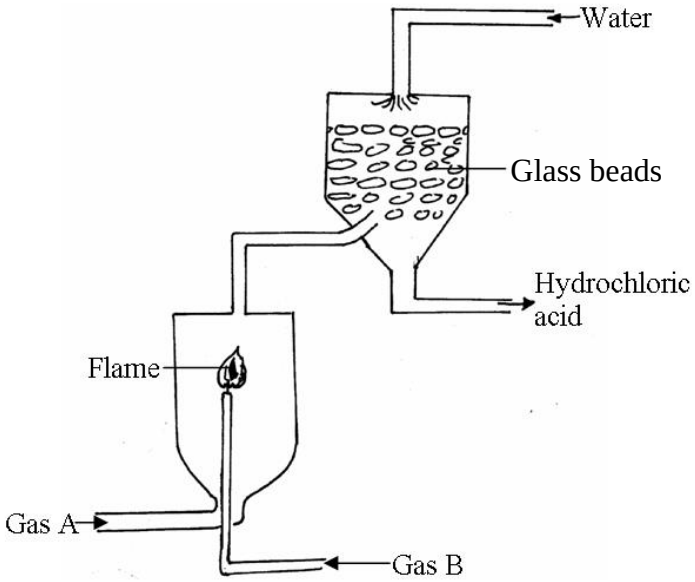
22. The diagram below represents large scale manufacture of hydrochloric acid. Study it and answer the questions that follow.



(a) Identify:

(i) Gas A (½ mk)

……

(ii) Gas B (½ mk)

……

(b) Write the chemical equation for the reaction between gas A and gas B. (1mk)

……

……

(c) State the role of the glass beads in the process. (1mk)

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……

23. (a) What are isomers? (1mk)

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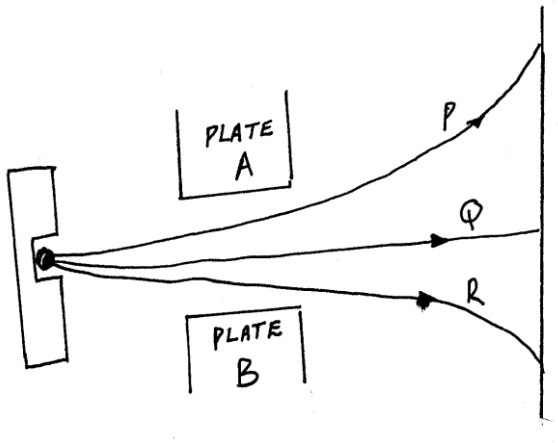
(b) Draw and name the two branched isomers of pentane. (3mks)

24. The diagram below shows the behaviour of radiations from a radioactive material in an electric field. Study it and answer the questions that follow.



(a) Identify the radiation P and R.

(i) P……. (1mk)

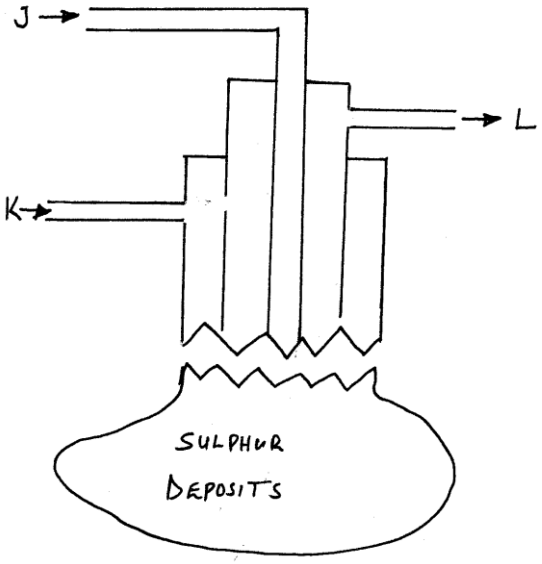
(ii) R……. (1mk)

(b) Identify the charge on:-

(i) Plate A……. (½ mk)

(ii) Plate B……. (½ mk)

25. Sulphur is extracted from underground deposits by a process in which three concentric pipes are sunk down to the deposits as shown below.



(a) Name the process represented above. (1mk)

……

……

(b) What is passed down pipe J? (1mk)

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……

(c) Name the two allotropes of sulphur (1mk)

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26. (a) What is hard water? (1mk)

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(b) Write the formulae of the two cations responsible for water hardness. (1mk)

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(c) Given that the formula of an ion exchange resin which softens water is Na_2X. Write any one ionic equation to show how the cations in (b) above are removed during water softening. (1mk)

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27. During electrolysis of copper(II)sulphate solution, a current of 4.0 Amperes was passed through the solution for Y minutes to deposit 2.39g of copper at the cathode. Determine the value of Y (Cu=64, 1F=96,500C). (2mks)

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28. Briefly state the meaning of the following terms in terms of oxidation number.

(a) Reduction (1mk)

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(b) Oxidation (1mk)

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