Name……………………………………………………………. Index No……………………………..

School……………………………………………………… Candidate's sign…………………….

Date…………………………………….

233/1
CHEMISTRY
PAPER 1
JULY / AUGUST 2010
Time: 2 Hours

MANGA DISTRICT JOINT EVALUATION TEST – 2010
Kenya Certificate of Secondary Education (K.C.S.E)

INSTRUCTIONS TO CANDIDATES

- Write your name and index number in the spaces provided
- Sign and write the date of examination in the spaces provided
- Answer ALL questions in the spaces provided
- Mathematical table and electronic calculators may be used.
- ALL working MUST be shown clearly where necessary

FOR EXAMINERS USE ONLY

QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORES
1 – 27	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. The flow chart below shows some properties of two allotropes of element Q
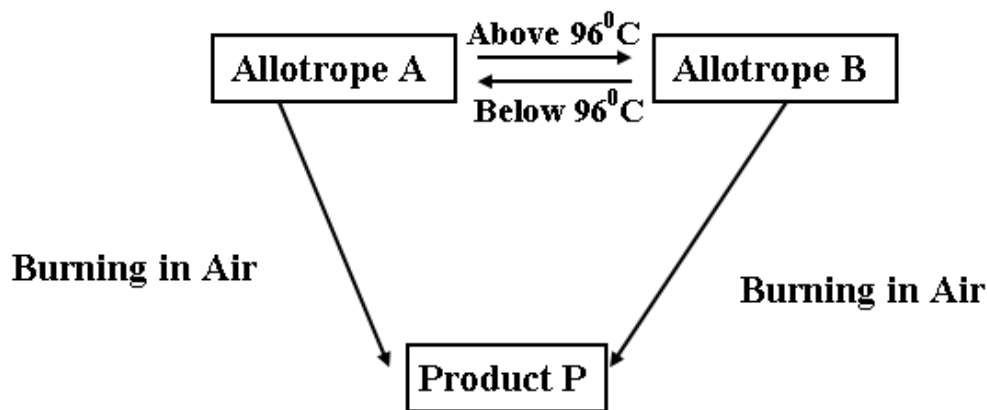
   i)   Name element Q   (½mk)

        …………………………………………………………………………………………..

        …………………………………………………………………………………………..

   ii) Write a chemical equation for the reaction forming product P   (1mk)

        …………………………………………………………………………………………..

        …………………………………………………………………………………………..

   iii) What term is given to the temperature 96^0C shown above?   (½mk)

        …………………………………………………………………………………………..

        …………………………………………………………………………………………..

2. A given element E has atomic number of 14 and consists of Isotopes as shown below

Isotope	X	Y	Z
Isotopic Mass	28	29	30
Percentage abundance	92.2	4.7	3.1

   a)   What are Isotopes?   (1mk)

        …………………………………………………………………………………………..

        …………………………………………………………………………………………..

   b)   Determine the relative atomic mass of E   (1½mk)

        …………………………………………………………………………………………..

        …………………………………………………………………………………………..

   c)   State the position of element E in the periodic table   (½mk)

        …………………………………………………………………………………………..

        …………………………………………………………………………………………..

3. Name the products formed when ammonia:-

   a) Decomposes when heated (1mk)

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   …………………………………………………………………………………………..

   b) Is burnt in air enriched with oxygen (1mk)

   …………………………………………………………………………………………..

   …………………………………………………………………………………………..

   c) Is oxidized in presence of platinum catalyst (1mk)

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   …………………………………………………………………………………………..

4. The diagram below shows the set-up in which direct electric current was passed into a dilute
   solution of sulphuric (VI) acid. Study it and answer the questions that follow.
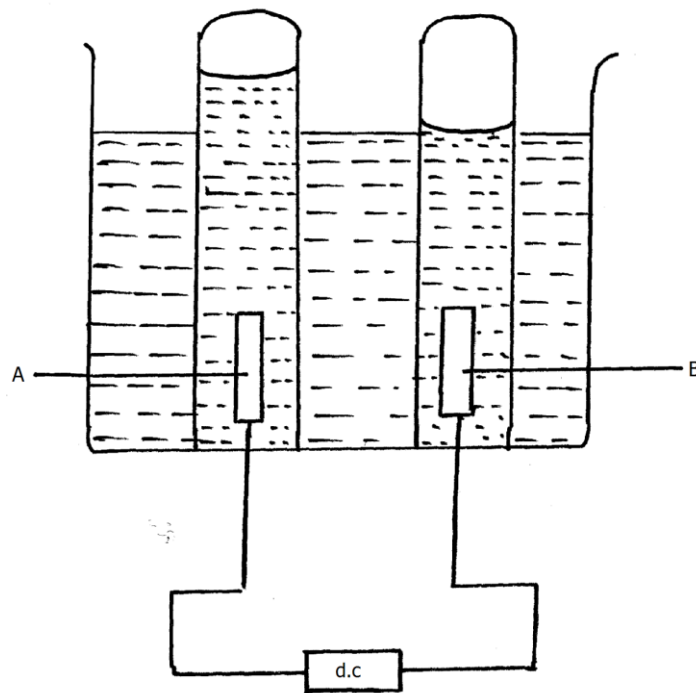
   a) Label the electrodes A and B

   A……………………………………………………….. (½mk)

   B ………………………………………………………. (½mk)

   b) i) Name the product collected at each electrode

   A……………………………………………………….. (½mk)

   B ………………………………………………………. (½mk)

   ii) Give a confirmatory test for the product formed at electrode A (1mk)

   …………………………………………………………………………………………..

   …………………………………………………………………………………………..

5. A mixture of activated charcoal and litmus solution was boiled then filtered.

    a) What is activated charcoal?   (1mk)

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        …………………………………………………………………………………………………..

    b) What is the colour of the filtrate   (1mk)

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        …………………………………………………………………………………………………..

    c) Explain the observation in (b) above   (1mk)

        …………………………………………………………………………………………………..

        …………………………………………………………………………………………………..

6. $80cm^3$ of hydrogen gas and $60cm^3$ of oxygen gas were reacted together to form water vapour

    a) Write the chemical equation for the reaction which took place   (1mk)

        …………………………………………………………………………………………………..

        …………………………………………………………………………………………………..

    b) Which gas was in excess and by how much?   (2mks)

        …………………………………………………………………………………………………..

        …………………………………………………………………………………………………..

7. The set-up below was used to collect the gas produced when anhydrous copper II nitrate was
    heated strongly
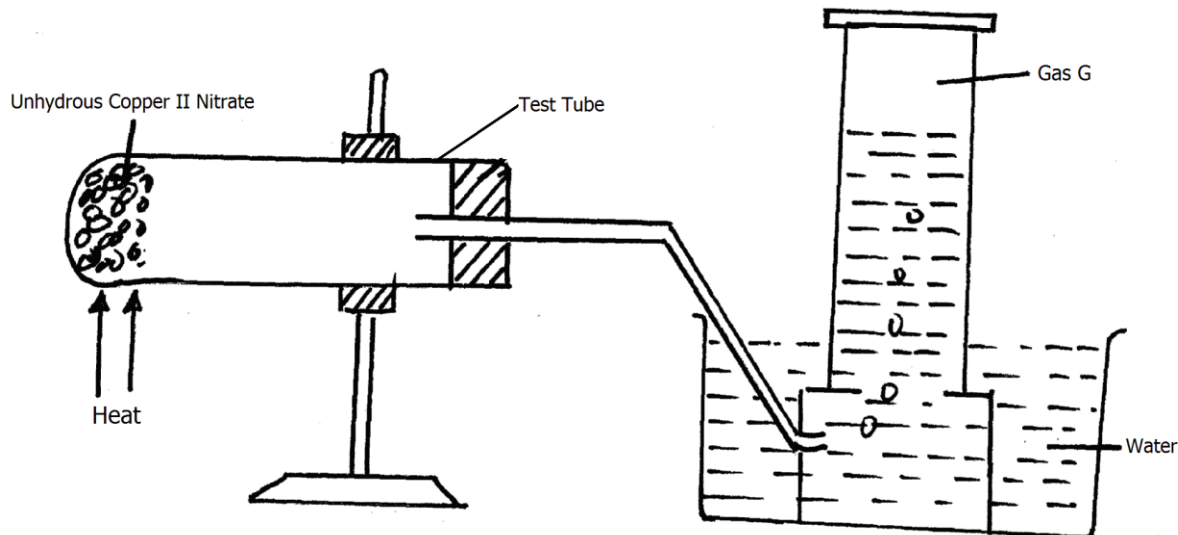
    a) State the two observations made in the test-tube during the experiment   (2mks)

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b) Identify gas G (1mk)

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8. A bottle containing nitric (V) acid has a label with the following information

i) Density = $1.42g/cm^3$

ii) Percentage purity = 68%

Calculate the concentration of the acid in moles per litre (H = 1, N = 14, O = 16) (3mks)

9. Name the most suitable method you would use to separate the following mixtures.

a) Calcium carbonate and ammonium chloride (1mk)

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……………………………………………………………………………………………………..

b) Kerosene from crude oil (1mk)

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……………………………………………………………………………………………………..

c) Oil and water (1mk)

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10. The table below shows PH values of solutions T to Z. Study it and answer the questions
That follow.

Solution	T	U	V	W	X	Y	Z
PH	3	5	7	14	2	8	10

a) Which solution is most likely to be

i) Ethanoic acid? (½ mk)

……………………………………………………………………………………………………..

……………………………………………………………………………………………………..

ii) Distilled water? (½ mk)

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    iii)   Sodium hydroxide solution?   (½ mk)

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    iv)   Ammonia solution?   (½ mk)

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b)   Identify two solutions which when mixed will give the highest change in

temperature   (1mk)

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11.   The apparatus below show the set-up used to prepare and collect hydrogen sulphide gas
Study it and answer the questions that follow
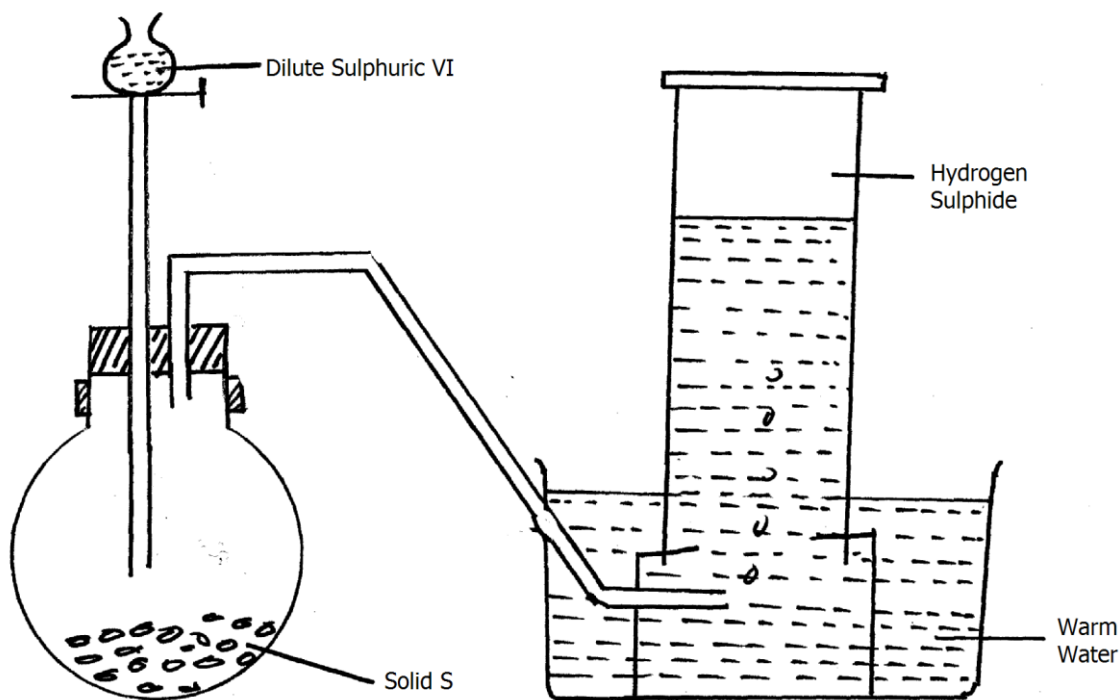
a)   Name solid S   (1mk)

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b)   Why is warm water used in the set-up?   (1mk)

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c)   State the observation made if the gas collected is bubbled into a solution of
     lead (II) nitrate   (1mk)

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     …………………………………………………………………………………………...

12. The graph below shows the energy curves for a reaction that was carried out without a catalyst,
     then repeated with a small amount of the catalyst and finally with a large amount of the catalyst.
     Study it and answer the questions that follow.
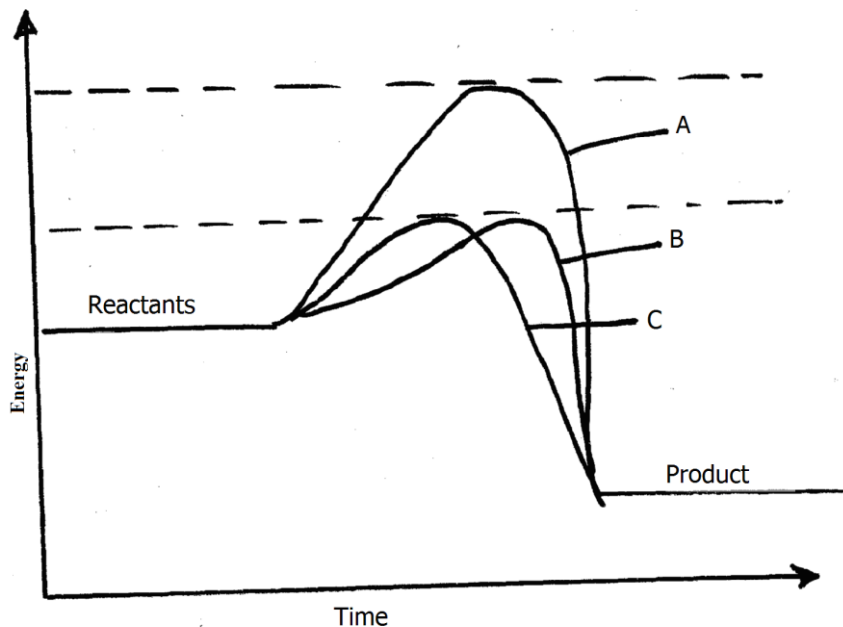
a)   Which curve represents;

     i)   The reaction in which a large amount of catalyst was used?   (½mk)

     …………………………………………………………………………………………...

     …………………………………………………………………………………………...

     ii)   The reaction without a catalyst?   (½mk)

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     …………………………………………………………………………………………...

b)   Explain how the catalyst affects the rate of a chemical reaction   (1mk)

     …………………………………………………………………………………………...

     …………………………………………………………………………………………...

c)   State the type of reaction represented by the diagram   (1mk)

     …………………………………………………………………………………………...

     …………………………………………………………………………………………...

13. Elements burn in oxygen to form basic, acidic, amphoteric or neutral oxides. Name two elements which form;

    a)   Amphoteric oxides   (1mk)

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    b)   Acidic oxides   (1mk)

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    c)   Basic oxides   (1mk)

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14.   a)   What is electrolysis?   (1mk)

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    b)   State any two applications of electrolysis   (2mks)

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15. When excess magnesium powder was added to $100cm^3$ of 0.5M copper (II) sulphate solution, the temperature changed from 22.0^0C to 28.0^0C.

    a)   Why was magnesium powder added in excess?   (1mk)

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……………………………………………………………………………………………………..

    b)   Calculate the molar heat of displacement for this reaction. (Density of solution is $1g/cm^3$, specific heat capacity of solution is $4.2Jg^{-1}K^{-1}$)   (2mks)

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    c)   Draw a simple energy level diagram for the above reaction   (1mk)

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16.   a)   Name two ores from which Zinc is extracted   (1mk)

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    b)   Write the chemical equation to show how Zinc is obtained from Zinc oxide   (1mk)

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c) State one use of Zinc (1mk)

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17. a) Name the chemical family to which;

     i) Group VII elements belong (1mk)

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……………………………………………………………………………………………………..

     ii) Group II elements belong (1mk)

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……………………………………………………………………………………………………..

b) State one use of a specified compound of a group one element (1mk)

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18. Given the following half cells

$$Pb^{2+}_{(aq)} / Pb_{(s)} \qquad E^0 = -0.13V$$

$$Cu^{2+}_{(aq)} / Cu_{(s)} \qquad E^0 = +0.34V$$

If the two half cells are connected to form a cell:

a) Write the ionic equation for the reaction in the half-cell where

     i) Oxidation occurs (1mk)

……………………………………………………………………………………………………..

     ii) Reduction takes place (1mk)

……………………………………………………………………………………………………..

b) Calculate the e.m.f of the electrochemical cell obtained from the two half-cells

above (1mk)

19. Radioactive carbon – 14 has half-life of 5600 years.

a) How many protons and neutrons are in the nucleus of carbon – 14? (1mk)

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b) How long will it take carbon – 14 to decay to $^1/_{32}$ of its original mass? (2mks)

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20. a) What is a polymer? (1mk)

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b) Give two example of natural polymers (1mk)

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21. Carbon (IV) oxide takes 200 seconds to diffuse through a porous plug. How long will it take the same volume of hydrogen chloride to diffuse through the same plug under the same conditions? (H = 1, C= 12, O = 16, Cl = 35.5) (3mks)

22. a) Using dots (.) and crosses (x) to represent electrons, draw the diagram of:

   i) An ammonium radical (1mk)

……………………………………………………………………………………………………..

   ii) Carbon II oxide (1mk)

……………………………………………………………………………………………………..

b) Elements P and E have electron arrangements of 2.8.1 and 2.6 respectively. Name the structure formed when P and E combine (1mk)

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23. When 27.8g of hydrated aluminium oxide ($Al_2O_3 .nH_2O$) was heated to a constant mass, 20.6g of aluminium oxide were obtained. Calculate the value of n in the formula.
(H = 1, O = 16, Al = 27) (3mks)

24.   Study the reactions below and answer the questions that follow

Reaction	Equation
J	$Ba^{2+}_{(aq)} + SO_3^{2-}_{(aq)} \longrightarrow BaSO_{3(s)}$
K	$HSO_4^-_{(aq)} + OH^-_{(aq)} \longrightarrow SO_4^{2-}_{(aq)} + H_2O_{(l)}$
L	$Br_{2(g)} + 2I^-_{(aq)} \longrightarrow 2Br^-_{(aq)} + I_{2(s)}$
M	$Fe_{(s)} + S_{(s)} \xrightarrow{\text{heat}} FeS(s)$
N	$2Fe^{2+}_{(aq)} + Br_{2(g)} \longrightarrow 2Fe^{3+}_{(aq)} + 2Br^-_{(aq)}$

Which of these reactions indicate a;

i)   Neutralisation reaction   (1mk)

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ii)   Precipitation reaction   (1mk)

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iii)   Displacement reaction   (1mk)

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25.   Study the diagram below and answer the questions that follow
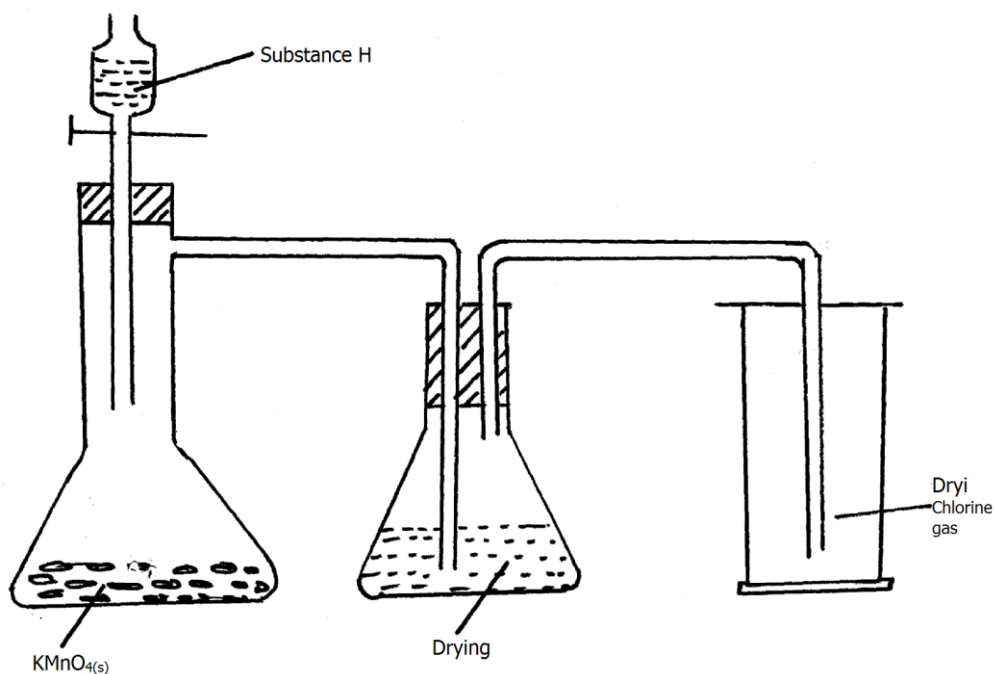
a)   Name;

i)   Substance H   (1mk)

H …………………………………………………………………..

ii)   A suitable drying agent that can be used above   (1mk)

……………………………………………………………………………………………………..

b)   What property of chlorine gas makes it possible for it to be collected as shown

in the diagram above?   (1mk)

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26. a) Name the type of flame produced by the Bunsen burner when the air –hole is fully Open (1mk)

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b) State one reason why the flame named in a) above is used for heating purposes in the laboratory (1mk)

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27. Below is a list of some members of a homologous series

Formula	Physical state at room temperature
CH_4	Gas
C_2H_6	Gas
C_3H_8	Gas
C_4H_{10}	Gas
C_5H_{12}	Liquid
C_6H_{14}	Liquid

a) What is meant by the term homologous series? (1mk)

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b) Explain the variation in the physical state of the members (1mk)

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c) Draw and name the branched isomers of C_5H_{12} (2mks)

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