MARANDA HIGH SCHOOL

Kenya Certificate of Secondary Education
PRE-MOCK EXAMINATIONS 2022

233/1 **CHEMISTRY** **Paper 1**

JUNE 2022 **TIME: 2Hours**

Name: ..... Adm No: .....

Class: .....Candidate's Signature: .....Date: ...../6/2022.

Instructions to candidates

(a) Write your name and index number in the spaces provided above.

(b) Answer **ALL** the questions in the spaces provided and show **ALL** working

(d) KNEC mathematical tables & silent non-programmable electronic calculators may be used.

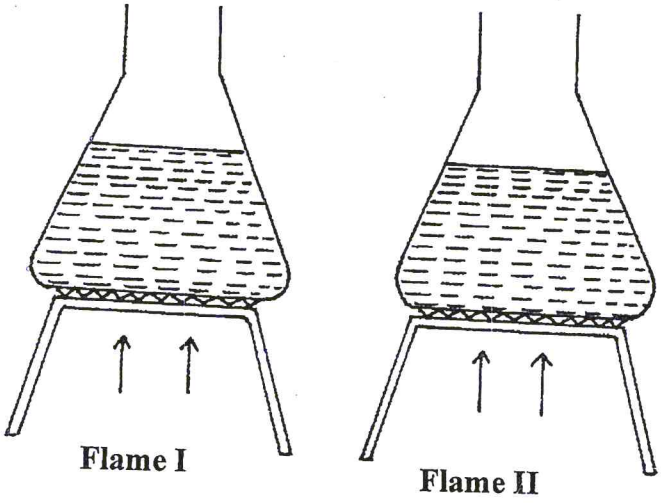
(f) This paper consists of **10** printed pages

(g) Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing

FOR EXAMINER'S USE ONLY.

Questions	Maximum Score	Candidate's Score
1 – 27	80	

1. The samples of equal volumes of water were put in 100cm^3 conical flasks and heated for 5 minutes on a Bunsen flame. It was observed that **sample I** registered a lower temperature than **sample II**



(a) Identify the flames (2 marks)

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(b) State one disadvantage of using flame I for heating (1 mark)

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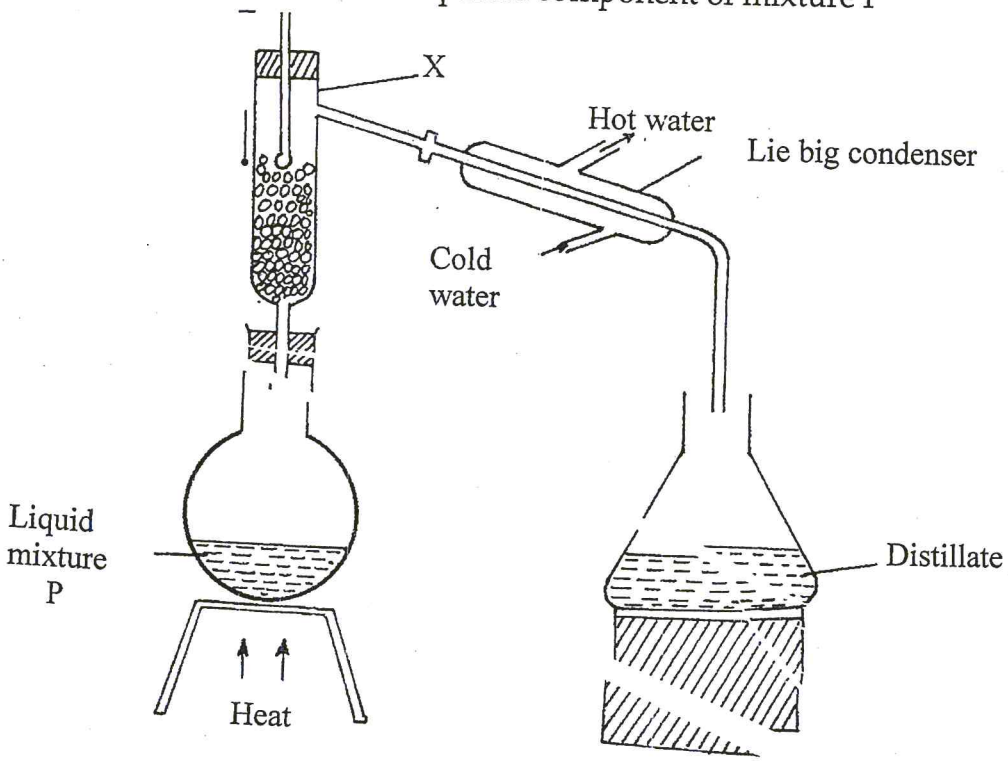
2. Study the diagram below and answer the questions that follow.
The diagram shows the method used to separate component of mixture P



(a) Name **X** (1 mark)

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(b) What is the name given to the method used in separation of **mixture P** (½ mark)

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(c) What would happen if the inlet and outlet of water were interchanged (½ mark)

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(d) Which physical property is used to separate mixture P (1 mark)

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3. (a) State why a water molecule H_2O can combine with H^+ ion to form H_3O^+ ion (1 mark)

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(b) Using dots (•) and crosses (×) show the bonding in H_3O^+ (1 mark)

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4. The pH values of some solutions are given below

pH	14.0	1.0	8.0	6.5	7.0
Solution	M	L	N	P	Z

(a) Identify the solution with the lowest concentration of hydrogen ion. Give reason for your answer (1 mark)

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(b) Which solution would be used as an anti-acid for treating stomach upset. Give a reason for your answer (2 marks)

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5. The data below gives the electronic configuration of some selected atoms and ions

Atom/ion	A^{2+}	B	C^{2-}	D^{2+}	E	F^-	G^+	H
Electronic configuration	2	2.4	2.8	2.8.8	2.8	2.8.8	0	2.8.2

(a) Select an atom that is a noble gas (1 mark)

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(b) Select an element that belongs to the second group and the fourth period. (1 mark)

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(c) Write the formula of the compound formed when D and F react (1 mark)

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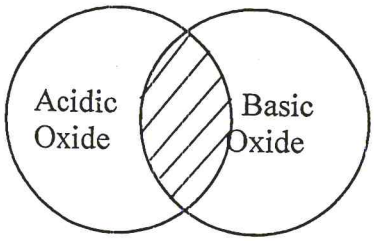
6. The diagram below shows the acidic and basic oxides fit into the general family of oxides.



a) State the name given to the type of oxide that would be placed in the shaded area. (1 mark)

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.....

b) Give the name of any oxide that would be placed in the shaded area. Explain (2 marks)

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7. Zinc metal and hydrochloric acid reacts according to the following equation

$$Zn_{(s)} + 2HCl_{(aq)} \rightarrow ZnCl_{2\,(aq)} + H_{2\,(g)}$$

3.26g of Zinc metal were reacted with 100cm^3 of 0.2M hydrochloric acid

a) Determine the reagent that was in excess (2 marks)

(Zn=65.2; Molar gas volume at s.t.p 22.4 liters)

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(b) Calculate the total volume of hydrogen gas that was liberated at s.t.p (1 mark)

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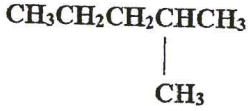
8. Give the IUPAC names of the following compounds



(i) .....

..... (1 mark)

(ii) $CH_3CH{=}CHCl$ ..... (1 mark)

(iii) $CH_3CH_2COOCH_2CH_2CH_2CH_3$ ..... (1 mark)

9. 0.9g of potassium chloride and potassium carbonate mixture completely reacted with 25cm^3 of 0.2M hydrochloric acid

(i) Determine the number of moles of the acid used (1 mark)

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(ii) Calculate the mass of potassium chloride in the mixture (K=39.0; C=12.0; O=16.0) (2 marks

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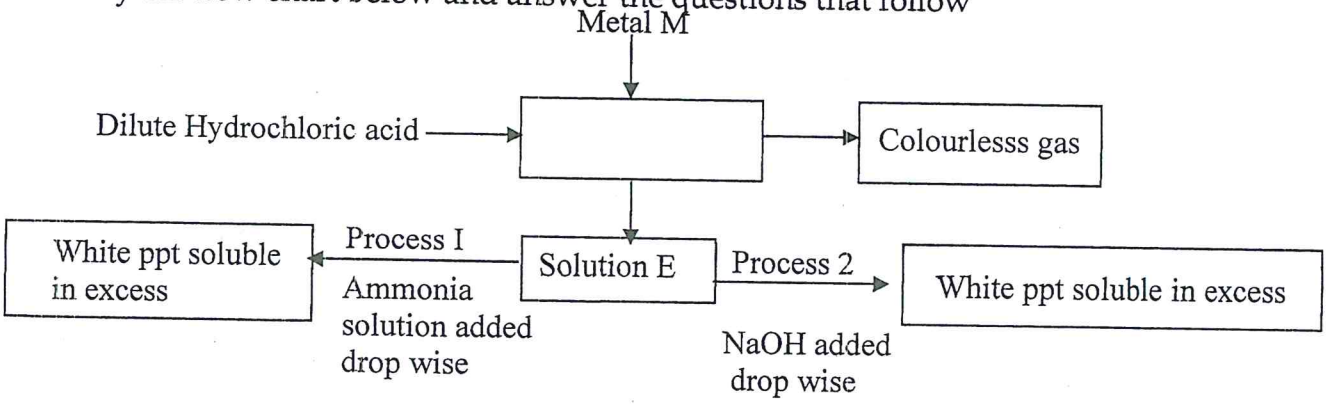
10. Study the flow chart below and answer the questions that follow



(i) Identify metal M: ..... (1 mark)

(ii) Colourless gas: ..... (1 mark)

(iii) Write an equation that leads to the formation of white precipitate in process (1 mark)

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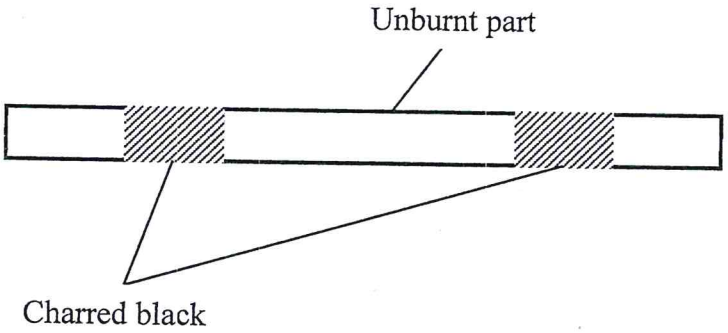
11. a) The diagram below shows a wooden splint that was placed horizontally across the middle part of a non-luminous flame.



a) Explain the observation made (1 mark)

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b) Explain why non-luminous flame is preferred for heating than the luminous flame. (2 marks)

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13. Few drops of hydrochloric acid were added into a test tube containing lead (II) Nitrate solution

a) State one observation made. Explain (2 marks)

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b) Write an ionic equation of the reaction that occurred in the test tube (1 mark)

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14. A compound of carbon, hydrogen and oxygen contains 57.15% carbon, 4.76% hydrogen and the rest oxy gen. If its relative molecular mass is 126, find its molecular formula. (C = 12, H = 1, O = 16) (3 marks)

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15. Study the information in the table below and answer the questions that follow.

Salt	Solubility g/100g of water	
	At 40°C	At 60°C
$CuSO_4$	28	38
$Pb(NO_3)_2$	79	98

A mixture containing 35g of $CuSO_4$ and 78g of $Pb(NO_3)_2$ in 100g of water at 60°C was cooled to 40°C.

i) Which salt crystallized out? Give a reason. (2 marks)

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ii) Calculate the mass of the salt that crystallized out. (1 mark)

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16. a) Distinguish between strong and concentrated acid (1 mark)

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b). A solution of ammonia in methylbenzene has no effects on red litmus paper while a solution of ammonia in water turns red litmus paper blue. Explain (2 marks)

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17. Name the process which takes place when

i. Iodine changes directly from solid to gas (1 mark)

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ii. $Fe^{2+}_{(aq)}$ changes to $Fe^{3+}_{(aq)}$ (1 mark)

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iii. White sugar changes to black when mixed with concentrated sulphuric (VI) acid (1 mark)

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18. In the last stage of the Solvay process, a mixture of sodium hydrogen carbonate and ammonium chloride is formed

a) State the method of separation used (1 mark)

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b) Write an equation showing how lime is slaked (1 mark)

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c) Name the by-product recycled in the above process (1 mark)

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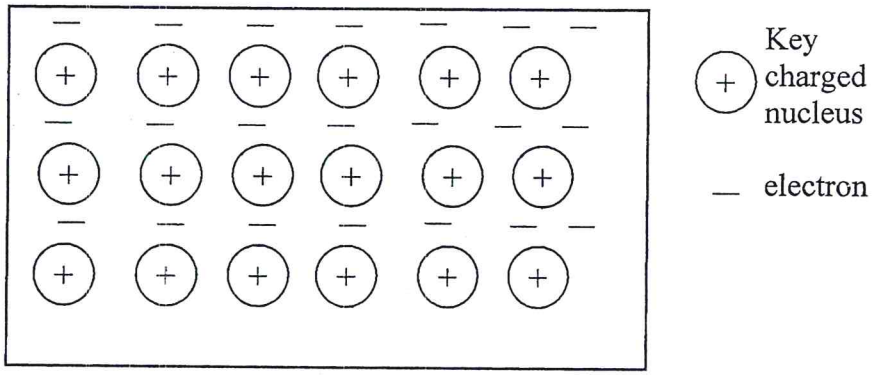
19. The diagram below is a section of a model of the structure of element **K**



a) State the type of bonding that exist in **K** (1 mark)

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b) In which group of the periodic table does element **K** belong. Give a reason (2 marks)

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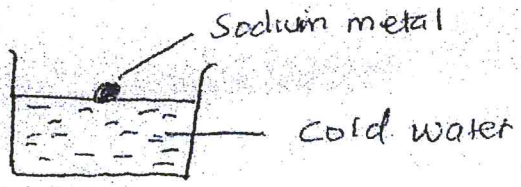
20. Study the diagram below and answer the questions that follow



a) State two observations made in the above experiment when sodium react with water (2 marks)

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b) Write a chemical equation for the reaction that takes place (1 mark)

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21. (a) Explain why permanent hardness in water cannot be removed by boiling (1 mark)

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(b) Name two methods that can be used to remove permanent hardness from water (2 marks)

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22. Dilute sulphuric (VI) acid was added to a compound X, of magnesium. The solid reacted with the acid to form a colourless solution, Y and a colourless gas Z which formed a white precipitate when bubbled through lime water.

Name:-

(i) Compound X (1 mark)

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(ii) Solution Y (1 mark)

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(iii)Colourless gas Z (1 mark)

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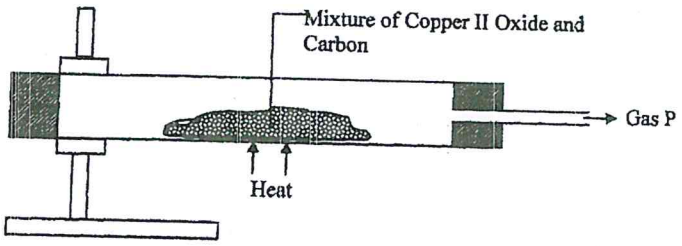
23. Study the diagram below and use it to answer the questions that follow.



(a) State the observation made in the combustion tube. (1 mark)

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(b) Write an equation for the reaction that took place in the combustion tube. (1 mark)

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(c) Name gas **P** (1 mark)

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24. Sulphur exists in two crystalline forms.

a) Name **one** crystalline form of Sulphur. (1 mark)

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b) State **two** uses of Sulphur. (2 marks)

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25. Bond energies for some bonds are tabulated below: -

BOND	BOND ENERGY KJ/mol
H - H	436
C = C	610
C- H	410
C - C	345

Use the bond energies to estimate the enthalpy for the reaction. (3 marks)

$$C_2H_{4(g)} + H_{2(g)} \longrightarrow C_2H_{6(g)}$$

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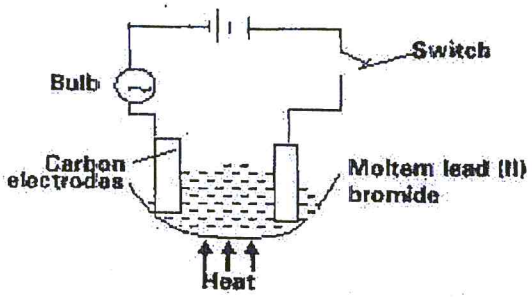
26. Study the set up below and answer the questions that flows



State all the observations that would be made when the circuit is completed (3 marks)

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27. Describe how solid samples of salts can be obtained from a mixture of lead (II) chloride, sodium chloride and ammonium chloride. (3 marks)

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