

Name: Index No:

Candidate's signature.....

Date.....

Muungano KCSE Trial Exam

233/2
CHEMISTRY
PAPER 2
July 2017
2 Hours

INSTRUCTIONS TO CANDIDATES

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

For Examiner's Use Only

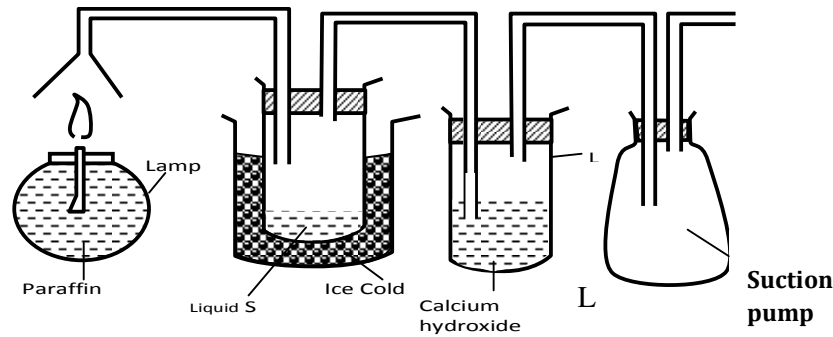
Question	Maximum Score	Candidates Score
1	12	
2	13	
3	10	
4	9	
5	11	
6	13	
7	12	
TOTAL	80	

This paper consists of 10 printed Pages

*Candidates should check the question paper to ensure that all the pages are printed as indicated
and no questions are missing*

Turn Over

1. Study the set-up of apparatus below and answer the questions that follow.



- a) **State** and **explain** the observation that would be made in tube **L** as the experiment progresses in the first few minutes. (2mks)

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- b) **How** would the observations in the tube **L** change if the experiment is carried out for a long time. **Explain** using a chemical equation. (2mks)

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- c) **State three observations** made when liquid **S** is reacted with sodium metal. (3mks)

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- d) **State the use** of the suction pump in this experiment. (1mk)

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- e) Diamond and graphite are allotropes of carbon. Graphite conducts electricity and diamond does not. **Explain** this phenomenon. (2mks)

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- f) State two uses of carbon (IV) oxide. (2mks)

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2. Study the information in the table below and answer the question that follow, letters do not represent actual symbols of the element.

<i>Element</i>	<i>Atomic No.</i>	<i>Melting point</i>	<i>Boiling point</i>	<i>Atomic radii</i>	<i>Ionic Radii</i>
<i>L</i>	3	-179	1340	0.108	0.100
<i>M</i>	9	-220	-188	0.101	0.105
<i>N</i>	11	98	890	0.135	0.132
<i>P</i>	12	650	1110	0.126	0.124
<i>Q</i>	13	660	2470	0.125	0.120
<i>R</i>	15	442/590	280	0.111	0.119
<i>S</i>	16	113/119	445	0.103	0.109
<i>T</i>	17	-101	-3	0.109	0.120
<i>U</i>	19	63.5	-775	0.167	0.160

- (a) **Write** the electronic configuration of an ion of elements *T* and *U*. (1mk)

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- (b) Why do the elements represented by *R* and *S* have two values of melting point? (1mk)

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- (c) **Select** an element:

- (i) Which is the most electronegative? (1mk)

.....

- (ii) That belongs to period 4, **explain**. (2mks)

.....

- (d) **Explain** why:

- (i) Ionic radius of *R* is bigger than its atomic radius. (1mk)

.....

- (ii) The atomic radius of L is bigger than that of R yet they are in the same period. (1mk)

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- (e) Using dots (.) and cross (x) to **represent** outermost electron show bonding in the compound formed between L and M . (2mks)

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- (f) **Write an equation** for the reaction that occurs between U and water. (2mks)

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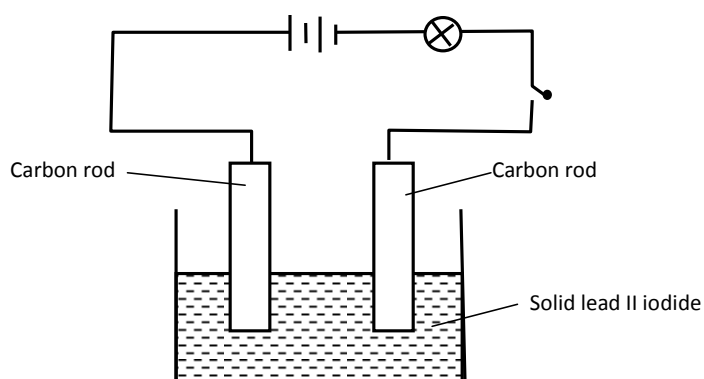
- (g) **Describe how** a solid mixture of the sulphate of element N and lead (II) sulphate can be separated into solid sample of dry lead (II) sulphate. (2mks)

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3. The arrangements below show a set-up to investigate the effect of an electric current on molten lead (II) iodide.



- (a) **Identify two** mistakes in the set-up. (2mks)

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- (b) **State three observations** made after correcting the mistakes. (2mks)

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- (c) **What particles** are responsible for electrical conductivity? (1mk)

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- (d) **Write the equations** for the reactions taking place at the electrodes. (2mks)

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- (e) **Indicate** on the diagram direction of flow of electric current. (1mk)

- (f) **State two industrial applications** of electrolysis process. (2mks)

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4. a) **State Boyle's law.** (2mks)

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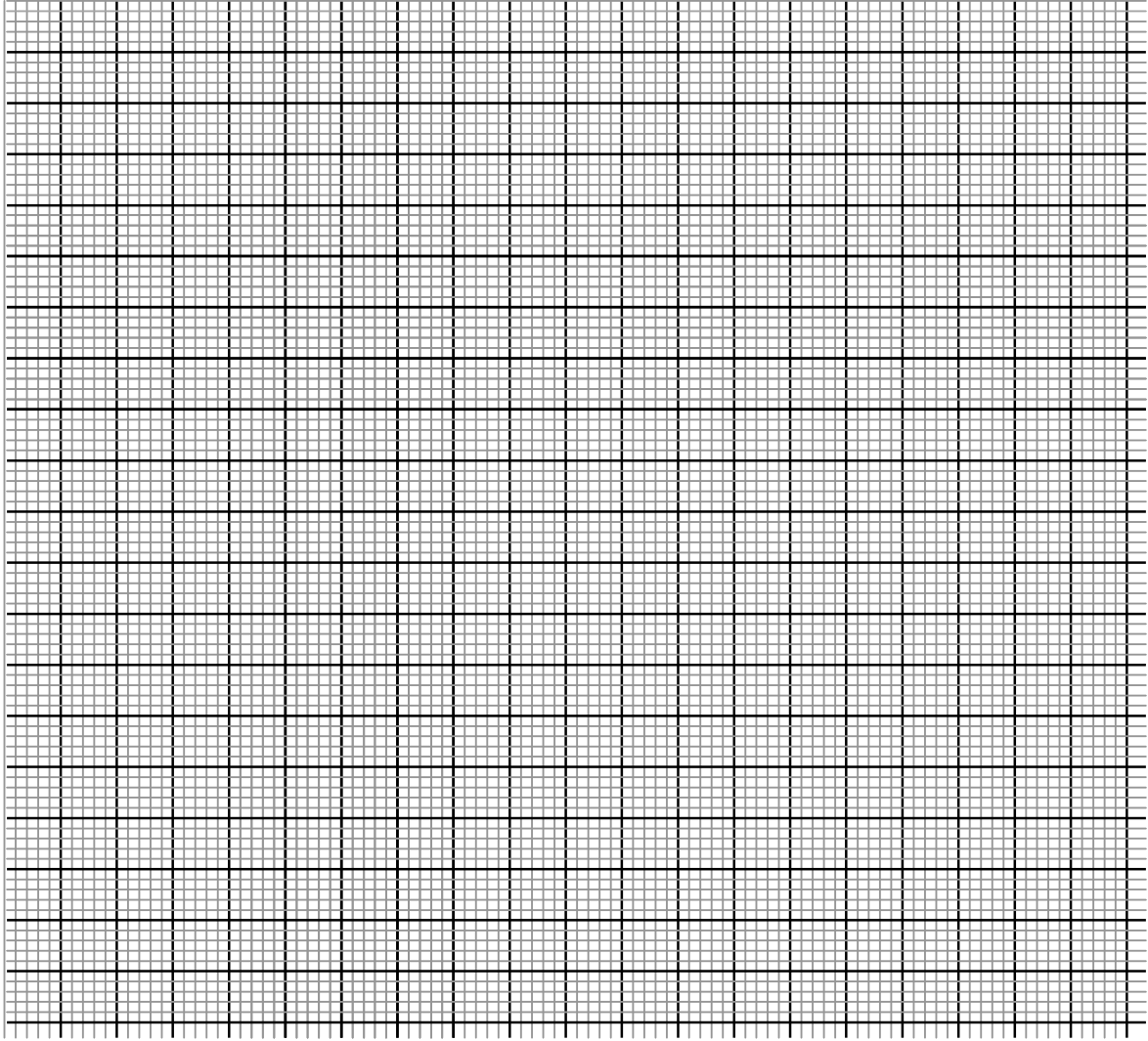
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- b) The table below shows the relationship between the pressure and volume of a fixed mass of ozone gas.

Pressure (K pa)	1	4	8	16	20	160
Volume (cm ³)	140	40	20	10	8	1
Inverse of volume 1/v (cm ⁻³)						

- i) Complete the table by filling the inverse of volume. (3mks)

ii) **Draw** a graph of pressure against the reciprocal (*inverse*) of volume. (3mks)

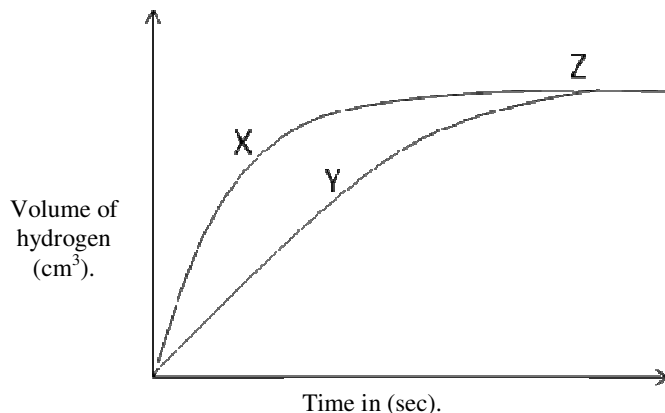


(c) Using the graph, **determine** the volume of ozone if pressure is 12Kpa. (2mks)

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5. Equal masses of magnesium ribbon were reacted separately with equal volumes of 1M hydrochloric acid and 1M methanoic acid. The results were plotted on a graph as shown below. Two curves X and Y were obtained.



(a) **Explain** which curves represents:

i) 1M hydrochloric acid.

(1mk)

.....

ii) 1M Methanoic acid.

(1mk)

.....

(b) **State** the significance of point Z.

(1mk)

.....

(c) On the same axes, **sketch the curve** you would obtain if the same mass of powdered magnesium were reacted with same quantity of 1M hydrochloric acid. Mark the curve W.

(2mks)

(d) **Write ionic equation** for the reaction between magnesium and dilute hydrochloric acid.

(1mk)

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(e) **Calculate** the maximum mass of the gas that would be liberated if 1.2g of magnesium reacted with excess hydrochloric acid. ($Mg = 24$, $H = 1$).

(2mks)

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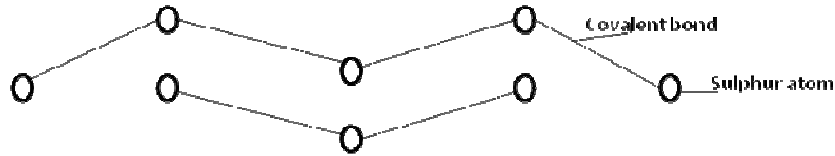
(f) **Calculate** the volume of the gas produced in (e) above at r.t.p (*molar gas volume at r.t.p*) = 24dm³. (3mks)

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6. I. Study the structure below and answer questions that follow



(a) **What** observation is made when the molecule above is heated to a temperature of 113°C? (2mks)

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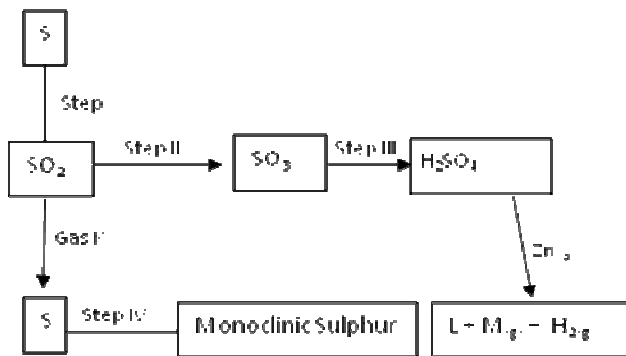
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(b) **Write an equation** for the reaction of atom of the above structure with hydrogen. (1mk)

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II. Study the scheme below and answer questions that follow.



(a)
i) **Name**

Gas **K** (1mk)

Gas **M** (1mk)



ii) **State** the observation made in

Step I (1mk)

.....

Step II (1mk)

.....

iii) **State the conditions** necessary for step II to occur. (2mks)

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(b) **Write an equation** to show how pollution effect of sulphur (IV) oxide is controlled in contact process. (2mks)

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(c) **Explain** the role of sulphur in vulcanization of rubber. (2mks)

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7. a) Study the table below and answer the questions that follows

Formula of hydrocarbon	Boiling points (K)
C ₂ H ₄	-104
C ₃ H ₆	-47.7
C ₄ H ₈	-62
C ₅ H ₁₀	30
C ₆ H ₁₂	63.9

(i) **What name** is given to a series of organic compounds like the ones in the table? (1mk)

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(ii) **To what class** of organic compounds does the above hydrocarbon belongs? (1mk)

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(iii) **Select one** hydrocarbon that would be a gas at room temperature (298K); give a reason for your answer. (2mks)

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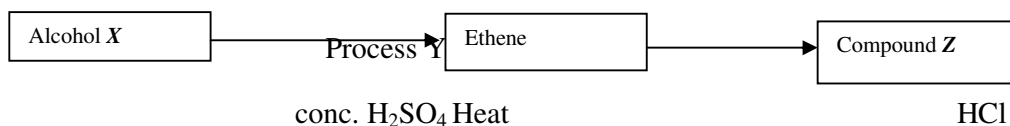
iv) **Give the formula** of the seventh member of the above series. (1mk)

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v) **What is** the relationship between the boiling point and the relative molecular masses of the hydrocarbons in the table above? **Explain** your answer. (2mks)

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



i. Write the formula of Alcohol X, Compound Z and name process Y. (3mks)

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ii. Propane and Chlorine react as shown below:
 $\text{CH}_3\text{CH}_2\text{CH}_3 \longrightarrow \text{CH}_3\text{CH}_2\text{CH}_2\text{Cl} + \text{HCl}$

Name the type of reaction that takes place. (1mk)

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iii **State** the condition under which this reaction takes place. (1mk)

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