CHEMISTRY

FORM ONE

SECTION A *(44 Marks)*

1. What is a pure substance? {1 mark}

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   ..... Define the following terms.

a) Radical. {1 mark}

b) Acid. {1 mark}

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2. State **TWO** reasons why most of the chemistry apparatus are glassware.

   {2 marks}

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3. Complete the table below. {2 marks}

Parameter	**Apparatus used to measure**	**Units**
Volume		
Temperature		

4. Name any **TWO** industries that have benefited from the knowledge of chemistry. {2 marks}

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5. What do the following laboratory signs mean?

a)

b)

d).

c).

6. State why it is important to adhere to the following laboratory rules.

{2 marks}

a) Label all the chemicals

.....

..... b) Never eat anything in the laboratory.

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..... Write a chemical equation showing the reaction between sodium metal and excess oxygen. {1 mark}

7. Study the equation below.

Heat

Zinc oxide  W

Cool

a) What is the colour of substance W

.....{½ mark}

b) What type of change is represented in the above equation? {½mark}

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c) Give another example of the change named in b) above.{1mark}

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8. a). Name any **FOUR** apparatus that are necessary to carry out fractional distillation of a mixture containing Distilled water and Ethanol in the laboratory. {2 marks}

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b).Which of the two components of the mixture will form the first fraction. Explain.{1 mark}

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c). State one industrial application of fractional distillation.{1mark}

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9. Study the equation below.

Hydrated copper (II) sulphate 

white Solid T + Colourless

Liquid H

a) Identify the;

i).White solid T .....

ii). Colourless liquid H .....{1 mark}

b) If Hydrated Copper (II) Sulphate had FIVE water molecules, write the chemical equation for the above reaction. {1 mark}

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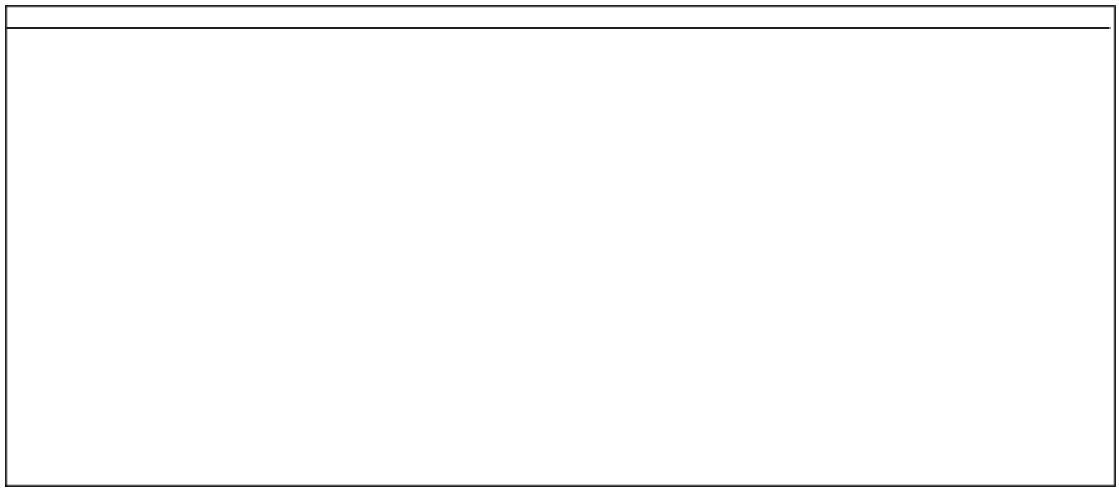
10. During the 2012 London Olympic Games, samples from four Decathlon participants (Morgan, Bolton, Jimmy and Jade) were taken and tested for presence of two illegal steroids A and B. Paper chromatography was used for the test.



Steroid A Steroid B Morgan Bolton Jimmy Jade

a) Which athlete(s) tested positive for the illegal steroid? {1 mark}

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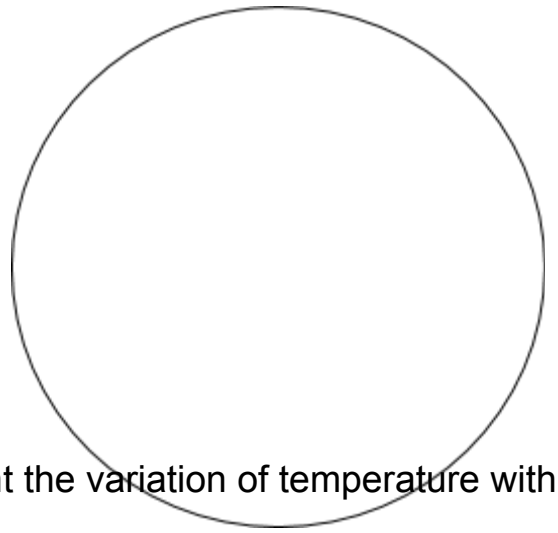
b) On the filter paper representation below, draw the results for the Bolton.{2 marks}



11. The curves below represent the variation of temperature with time when pure and impure samples of a solid were heated.

Solid K

Temperature in ˚C

Solid F

Time in seconds

a) Which of the two curves shows the variation in temperature for pure solid? Explain.{2 marks}

b) If 300 grams more of the pure substance was added to the sample, show on the graph the time that the sample the pure substance will boil. {½ mark}

c) On the graph above, indicate the boiling point of the pure substance.{½ mark}

12. Arnold, a student from Starehe Boys' Centre Situated 3050m above the sea level boiled 100cm3 of pure water. Another student, Annette, from Mombasa 0 metres above the sea level boiled the same volume of pure water.

i. Which of the two students took the longest time to boil water? {1mark}

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ii. Explain your answer in d, i) above? {1 mark}

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13. Describe the steps you would take to obtain common salts from sand that were mixed accidentally salt.{3 marks}

14. Complete the table below. {2 marks}

	Solid	**Liquid**	**Gas**
Shape			Indefinite
Volume		Fixed	Not fixed
Density	Very high	High	
Packing of molecules	Tight	Apart	Far apart

15. a). Draw a well labelled diagram showing how electrical conductivity of a given solid can be tested in the laboratory.

b). Name one non- metal that conducts electricity {1 mark}

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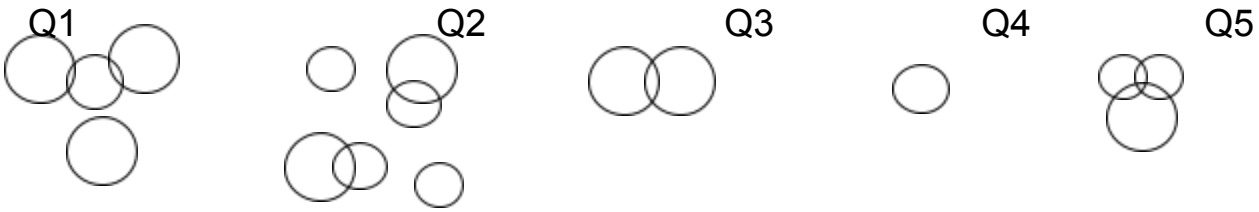
16. Study the diagrams below.



Which of the following sets of drawing clearly illustrates?

{2 marks}

a) Hydrogen molecule (H_2)

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b) Ammonia molecule (NH_3)

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c) Helium molecule (He)

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d) Mixture of Sodium Chloride (NaCl) and Helium (He)

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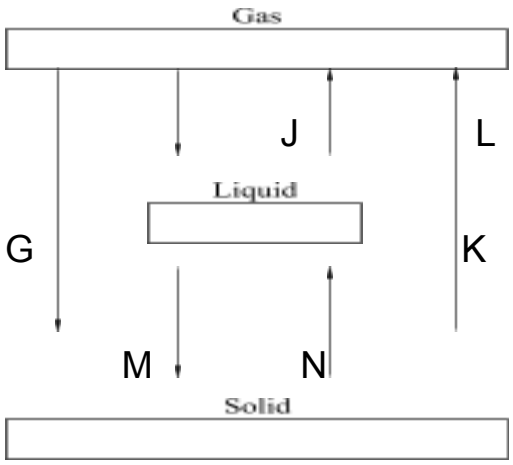
17. The figure below shows the changes that take place between states of matter.



a) Give the names of the processes J and K.

{1 mark}

J .....

K .....

b) Name one substance that can undergo process K when left in an open container. {1 mark}

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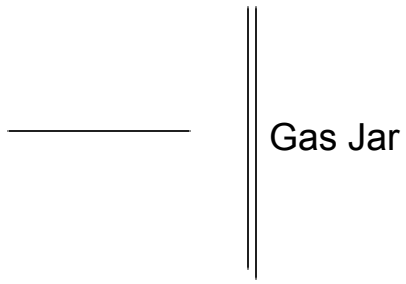
18. Below are two methods of collecting gases in the laboratory.

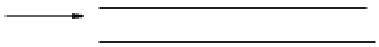
Gas in

Method G1



Gas Jar

Method G2



Gas in

a) Name the methods represented by G2.

..... {½ mark}

b) Name an example of gas that can be collected using G1.

..... {½ mark}

SECTION B: *(56 Marks)*

19. What is the meaning of the following?

c) i). Drug. {1 mark}

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ii). Dosage. {1 mark}

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iii). Drug addiction. {1 mark}

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d) Differentiate between Over the Counter (OTC) drugs and Prescription Drugs. {1 mark}

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e) Mr. Rudisha went to a doctor who sent him to a pharmacy to pick some drugs. The pharmacist wrote on the medicine packaging 2X3. Clearly state what 2X3 meant.{1 mark}

f) State two reasons why it is important to adhere to the doctor's prescription.

{2 marks}

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g) State **THREE** common effects that tobacco smoking and alcohol consumption have. {3 marks}

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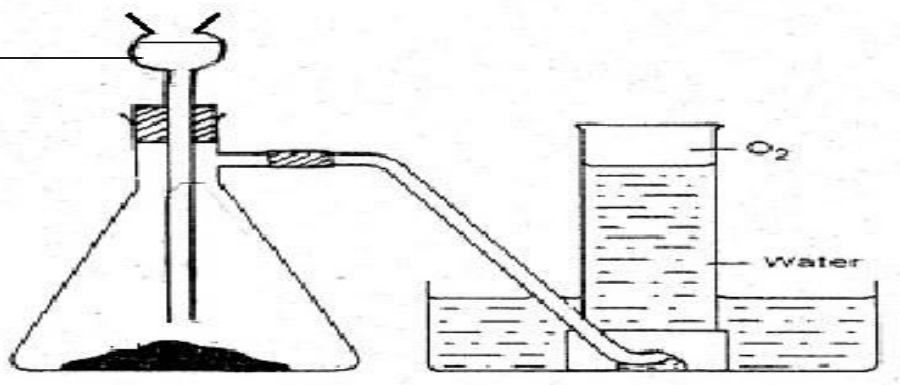
20. The diagram below show the apparatus used to prepare oxygen in the laboratory.

Y



Black Solid X 

a) Name the reagents X and Y {2 marks}

Y X

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b) Why is reagent X used yet reagent Y can decompose to produce Oxygen gas? {1 mark}

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c) Why is it possible to collect oxygen gas using the method above?{1 mark}

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d) State **TWO** other physical properties of Oxygen gas.{2 marks}

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e) Describe the test you would carry to prove that the gas collected is Oxygen.

{2 marks}

f) Write the chemical name and chemical formulae of rust.

{2 marks}

Name .....

Formula .....

g) The diagram below illustrates one of the methods used to prevent rust, study it carefully.

Zinc  Stripes

Iron metal

h) Which method of rust prevention is shown in the diagram above?

{1 mark}

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i) Why is it possible to prevent rust using the method named in g) above?

{1 mark}

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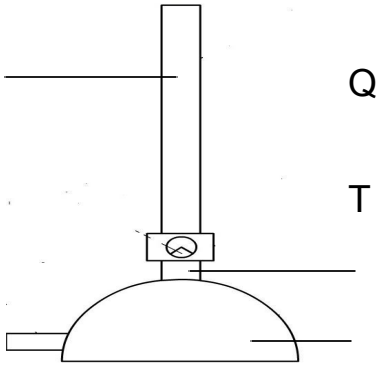
21. Study the diagram below.



a)The apparatus is used to heat substances in the laboratory.

i. Name the parts marked with letters Q, R, S and T. (Name on the diagram).

{2 marks}

ii. Describe **FIVE** Steps followed when lighting the apparatus above.

{2½ marks}

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iii. On what flame should the apparatus be left when not being used in the laboratory? {½ mark}

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iv. State **TWO** reasons for the answer given in iii) above.

{2 marks}

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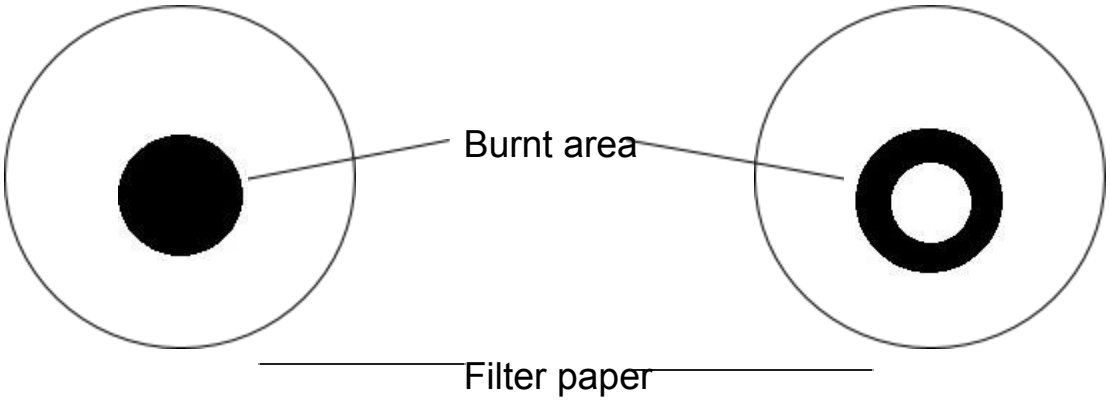
b)The diagram below shows the appearances of two pieces of filter papers placed on different parts of a particular flame of a Bunsen burner.



i. Which flame of the Bunsen burner was used for the experiment?

{1mark}

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ii. What conclusion can you make from the above experimental results?

{2 marks}

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22. a). Define the following.

i. Element. {1 mark}

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ii. Compound. {1 mark}

b). Write the chemical symbols for the following elements. {1 mark}

i. Chlorine ..... ii). Sodium .....

c). Write the name of the elements represents by the following chemical symbols. {1 mark}

i). K .....

ii). F.....

d). How **many** elements make up the following compounds?

i. $Na_2CO_3.NaHCO_3.2H_2O$ {1 mark}

.....

ii. $NaHCO_3$ {1 mark}

.....

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e). Write the chemical formulae of the following chemical compounds. (Show your working)

i. Aluminium phosphate. {1 mark}

ii. Copper nitrate. {1 mark}

iii. Magnesium sulphate. {1 mark}

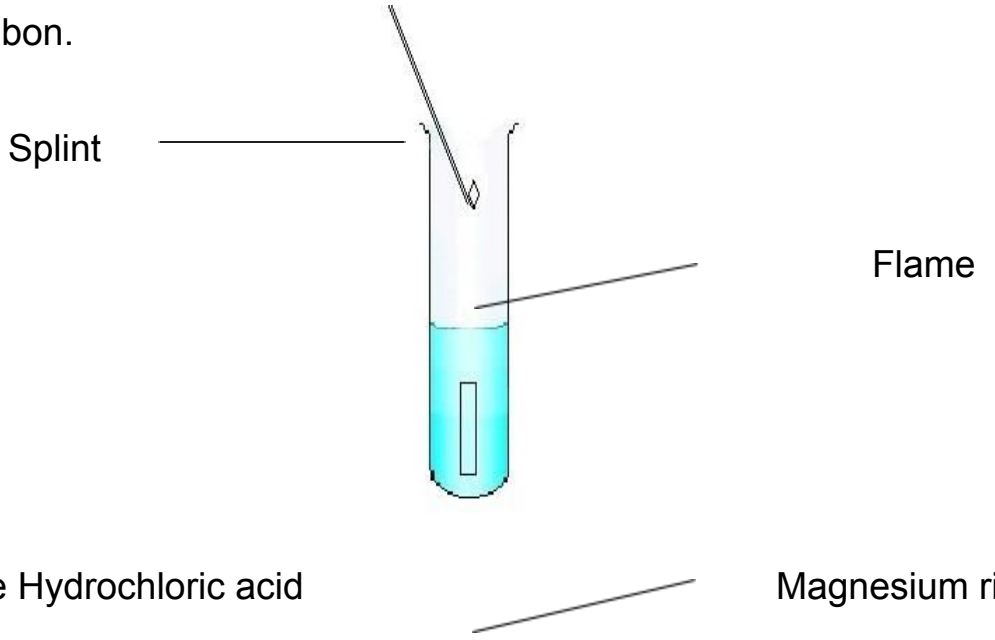
f). Write the number of atoms of each element present in the following compounds.

i. H_2SO_4 {1 mark}

ii. $CuSO_4 \cdot 10H_2O$ {1 mark}

iii. Na_2CO_3 {1 mark}

23. The diagram below shows the action of dilute acids on a magnesium ribbon.



a) State any **TWO** observations made from the above set up.

{2 marks}

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b) Write a chemical equation for the reaction taking place between the acid and the metal.

{1 mark}

c) The following is a list of some pH values; 2, 4, 5, 7, 9 and 13. Complete the table below indicating the appropriate pH values.

{2 marks}

Substance	**pH Value**
Dilute hydrochloric acid	
Wood ash Solution	

Orange juice	
Distilled water	

d) State one advantage of using the universal indicator over flower extract indicators.{2 marks}

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e) What is a “neutralization reaction”? {1 mark}

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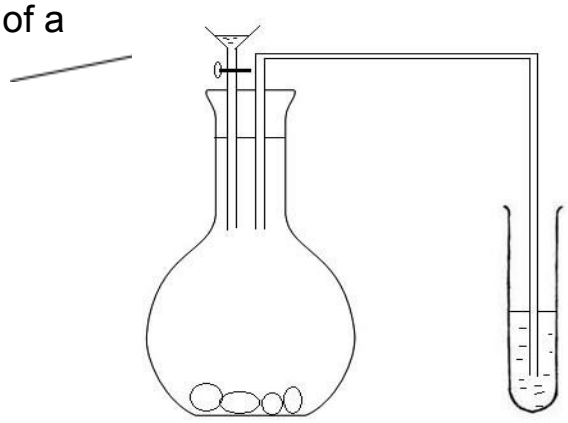
f) In another experiment students reacted sulphuric (VI) acid with solid P which is a compound of magnesium. A colourless solution Q was formed with production of a colourless gas Z.

H2so4



Solid P ——————— Lime water

When the colurless gas Z was bubbled in lime water, it formed a white precipitate.

i. Identify colourless gas Z.
{1 mark}

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ii. Identify compound P. {1 mark}

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iii. Write the chemical formula of compound P.
{1 mark}

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iv. Name colourless solution Q. {1 mark}