Form 1 Chemistry marking scheme

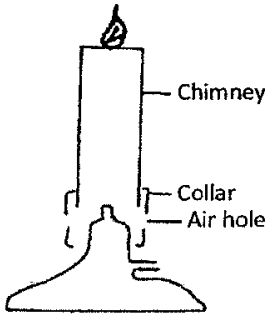
1(i) Define Chemistry. (1mk)

Is a branch of science which studies structure and composition of matter and the way they behave under different condition

(ii) Give three importance of studying Chemistry. (3mks)

- **Chemistry has contributed a lot to modern technology e.g. the extraction of chemicals from plants**
- **Manufacture of substances such as soap,glass,plastics**
- **When texts are carried out in hospital laboratories to diagonise**

2. The diagram below shows the apparatus commonly used in a laboratory.



(i) Name the apparatus. (1mk)

Bunsen burner

(ii) State the function of the parts labeled in the above apparatus.

a) Chimney. (Imk)

Site of mixinglaboratory gases and air

b) Collar (1mk)

Regulate amount of air entering chimney

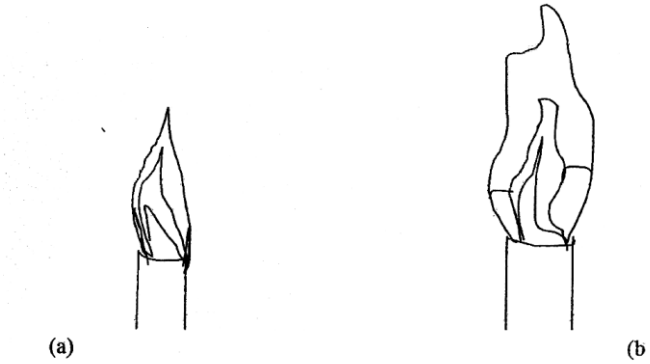
c) Air hole. (lmk)

Allow air to enter the chimney

(iii)What is a flame? (lmk)

A mass of burning gases

(iv) The following diagrams represent the two types of flames produced by a bunsen burner.



a) Identify the flames (a) and (b) (2mks)

a **non-luminous**

b) Luminous

b) Which type of the flames identified above is preferred for heating? Give a reason for your answer. (2mks)

Non –luminous flame - produce a lot of heat
- Doesn't produce soot

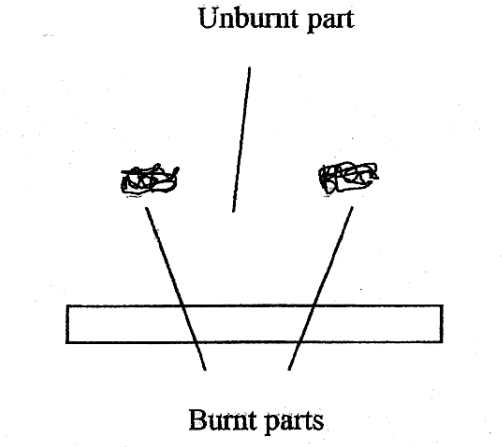
c) Give four differences between the flames (a) and (b) above. (4mks)

flame a (non-luminous)	**flame b (luminous)**
Doesn't produce light	**Produce light**
Doesn't produce soot	**Produce soot**
It has three regions	**It has four regions**
Very hot	**Fairly hot**
Burns with roaring sound	**Burns quietly**
Short and steady	**Long and wavy**

d) (i). Give two reasons why flames (a) and (b) in 4(ñ) above differ. (2mks)

flame (a) was produced when the air hole was fully opened while (b) is formed when the air hole is fully closed

(v) A wooden splint was slipped through a region of a particular flame of the Bunsen burner in the laboratory. The split was burnt as shown in the diagram



a) Name the type of flame the splint was slipped through. (1mk)

Non-luminous flame

b) Explain why the splint was burnt the way it is shown in the diagram. (2mks)

The non-luminous flame has three regions: almost colouress zone which is not hot, green blue zone which is the fairy hot and pale blue zone which is the hottest part. burnt parts at the ends were burnt due to pale blue zone; the middle unburnt part was directly in almost colouress zone which is not hot enough

(vi) After use, the non-luminous flame should be put off or adjusted to luminous flame. Explain.(2mks)

- **Since it is invisible, it can easily cause an accident of burns in the laboratory**
- **To save of fuel gas**

(v) Putting off flames is one of the laboratory safety rules. State THREE other rules. (3mks)

- **Never taste anything or drink anything in the lab**
- **Do not do unauthorized experiments**
- **Never smell gas directly**
- **All experiments emiting poisonous gases/fumes should be performed in a fume chamber or open space**
- **Do not put insoluble materials into the sinks**

3. a) What is a drug? (1 mk)

This is a substance that atters/changes the normal functioning of the body when taken

b) Name two commonly legal abused drugs (2 mks)

- **Alcohol**
- **Cigarette**
- **Khat/miraa**
- **Otcs**

4. Describe briefly how a mixture of sand and sodium chloride can be separated (3 mks)

Add water to the mixture in a beaker and stir. filter to obtain sand as residue and sodium chloride as filtrate, heat the filtrate to evaporate water in an evaporating dish to get sodium chloride

5 a) State three differences between temporary and permanent changes (2 mks)

Temporary change	Permanent change
Easily reversible	**Irreversible**
No new substance formed	**New substance formed**
Mass of substance does not change	**Mass of substance changes**
Not accompanied by heat change	**Heat energy released or absorbed**

b) Classify each of the following changes as either temporary or permanent (4 mks)

(i) Striking a match to burn.

Permanent

ii) Diluting ethanol with water

Temporary

iii) Burning a piece of paper.

Permanent

6. (i) Define the terns.

a) Element. (1 mk)

Pure substance which cannot be split into simple substance by any chemical mean

b) Compound. (lmk)

Pure substance made up of two or more elements that are chemically combined

(ii) State two differences between a compound and a mixture. (2 inks)

(iii) In the table below c1assify the following substances by ticking (√) the correct identity. (4mks)

Substance	Element	Compound	Molecule
Zinc	✓		
Hydrogen gas			✓
Zinc oxide		✓	
Water		✓	

(iv) Identify the elements present in the following compounds.

a) Lead oxide (1mk)

Lead and oxygen

b) Magnesium nitrate ($1^1/_2$ marks)

Magnesium, nitrogen and oxygen

c) Calcium sulphate ($1^1/_2$ marks)

Calcium, sulphur and oxygen

(v) Write down the chemical symbol of the following elements. (2mks)

Element	Chemical symbol
Sodium	**Na**
Hydrogen	**H**
Chlorine	**Cl**
Zinc	**Zn**

7. Study the table below which shows the p{ values of solutions A, B, C, U and E. Use it to answer the questions that follow.

Solution	A	B	C	D	E
PH	13.0	7.0	9.0	6.5	2.0

i) Which solution is the most acidic? (1 mk)

E

ii) Which solution is a neutral? (1 mk)

B

iii) Identify the solution that is most likely to be:

(a) Rain water

D

(b) Antacids tablet

C

(c) Sodium hydroxide (3mks)

A

8. (a) What is an acid-base indicator? (1 mks)

This is a substance that shows different colours when in an acid and when in an alkali

(b) Fill in the table below to show the colours of the following indicators. (3 mks)

Indicator	Colour in acid	Colour in alkali
Litmus	**Red**	**Blue**
phenolphthalein	**Colourless**	**Pink**
Methyl orange	**Pink**	**Yellow**

(c) Consider the following general reaction

Acid+Base ⟶ salt+water

i) Name the type of reactions shown above. (I mk)

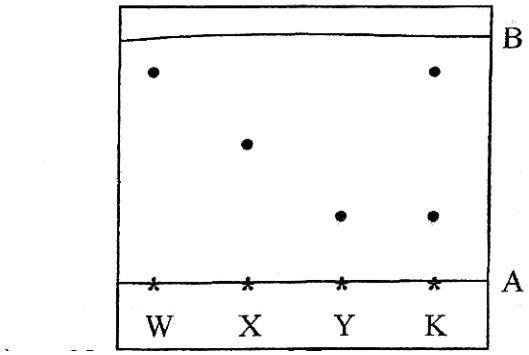
Neutralisation

(ii)Name one example of each of the following. (2 mks✓)

Acid: **Hydrochloric acid/sulphuric acid/nitric acid**

Base: **Sodium hydroxide/potassium hydroxide/calcium oxide**

9. The diagram below shows a chromatogram of pure dyes W, X andY. It also contains that of an impure substance K.



(a) Name lines **A** and **B** (1mk)

A - **Base line**

B - **Solvent front**

(b) Identify which. Pure dyes substance K contain.. (1mk)

W and y

(e) Which two properties of the component of the mixture facilitate separation? (2 mks)

Difference in solubility of components in solvent used

Difference in extent of absorption on the filter paper

(d) Normally line A is drawn using a pencil and not ink. Explain why the pencil is preferred to ink. (1mk)

Ink contains different dyes thus will also separate

(e) State one application of chromatography. (1 mk)

In sports to identify use of illegal drugs

To detect presence of impurities in coloured substances

10. Give two reasons why laboratory apparatus are made of glass. (2 mks)

Easy to clean

Glass don't react with most chemicals

Glass is transparent

11. (a)State the conditions necessary for rusting to take place. (2 mks)

Water/moisture

Oxygen/Air

(b) Apart from oiling, painting and greasing state two other methods of preventing rusting. (2 mks)

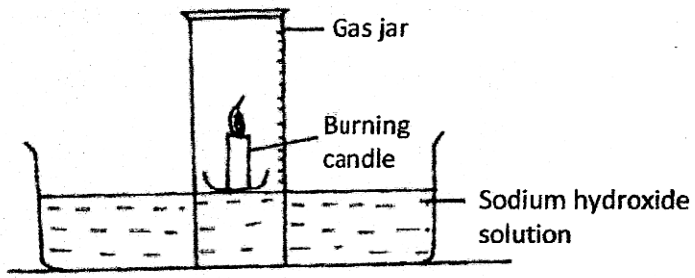
Galvanising

Electro plating

Sacrificial protection

Alloying

12, The follow set-up was used. by some students to study some properties of air.



(a) State two observations made after a few minutes. (2 mks)

Burning candle goes off

Level of NaoH solution in gas jar rises

(b) Name the gas that occupies the largest volume after the experiment (1 mk)

Nitrogen

(c) Tile percentage of air used w as calculated to be 19.375% while the approximate Percentage of oxygen is 21%. State one source of error. (1 mk)

The candle may have gone off before all the oxygen was exhausted

(d) Why is sodium hydroxide solution preferred to water in this experiment? (1 mk)

Sodium hydroxide solution absorbs carbon (iv) oxide produced faster than water thus enabling the candle to continue burning

(e) Why is it advisable to allow the apparatus to cool before the final volume is taken? (1 mk)

Gas expand when heated, thus has to be allowed to cool in order of their reactivity with oxygen or water or any other

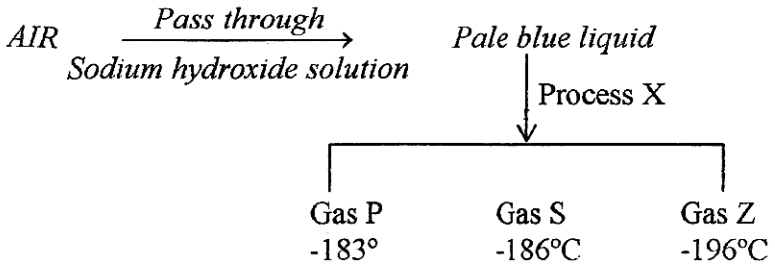
12. (a) Define the term reactivity series (1mk)

It is an arrangement of elements in order of their reactivity with oxygen or water or any other **substance**

(b) Arrange the following metals in order of their reactivity starting with the most reactive Cu, Mg, Zn, K, Na, and Fe

K, Na, Mg, Zn, Fe, Cu

13 Study the flow diagram below which. represents a summary of separation of liquid air.



(a) (i) Identify the gases.

P-**Oxygen**
S-**Argon**
Z-**Nitrogen**

(3mks)

(ii) Name process X. (1 mk)

Fractional distillation

(iii) What is the role of sodium hydroxide solution in the above flow diagram? (1 mk)

To absorb carbon(iv) oxide

(b) Name:

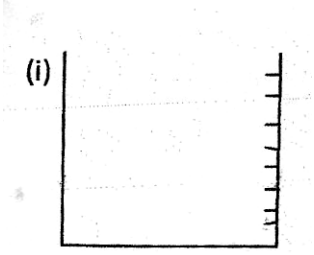
(i) A compound that is normally present in air (1 mk)

Water/carbon (iv) oxide

(ii) An element that is normally present in air (1mk)

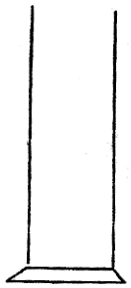
Noble gases particularly argon

14. The following are laboratory apparatus used in Chemistry. Name them and give their uses. (Imk)



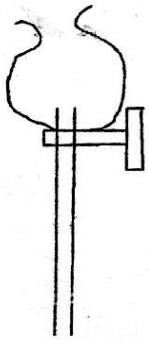
Water baker
Handling of reagents

(ii)



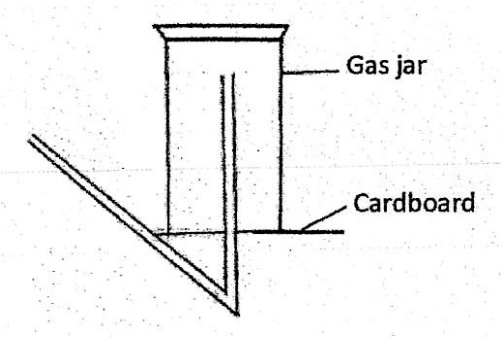
Measuring cylinder
Measuring volume of liquids

(iii)



Dropping funnel – preparation of gases

15. The diagram below illustrates one of the methods of gas collection in the laboratory.



(a) Name the method.
Upward delivery

(b) Name one gas that can be collected using this method. Explain your answer. (1 ½ mks)

Ammonia / Hydrogen
It is less denser than air