

CHEMISTRY EXAM
FORM ONE
MARKING SCHEME:

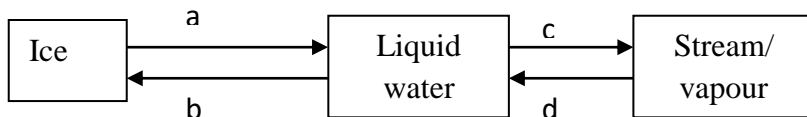
1. Explain why most laboratory apparatus are made of glass. (2mks)
- **Glass is easy to clean.**
 - **Glass does not react with most reagents.**
 - **Glass is transparent hence allow one to see clearly the reactions taking place.**
- (any 2 x 1 = 2mks)

2. (a) What is drug abuse? (1mk)
- **It is the overdose or under dose of a prescribed drug.**
 - **The use of drugs for a purpose other than what is intended for.**

- (b) Name three drugs that are commonly abused. (3mks)
- Alcohol**
Tobacco
Bhang
Miraa (khat)
Mandrax
Cocaine

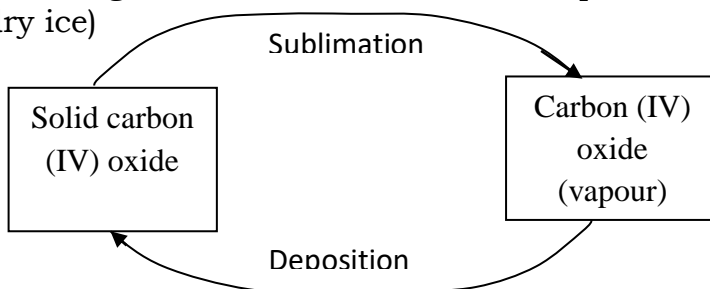
- (c) State two ways of preventing drug abuse. (2mks)
- **Avoid peer pressure.**
 - **Avoid taking drugs without the doctor's advice.**
 - **Avoid taking drugs for pleasure.**
 - **Avoid company of drug users.**

3. Study the diagram below and answer the question that follows.



- a) Name the process labeled a, b, c and d. (2mks)
- a - melting**
b - freezing.
c. - evaporation.
D - condensation. (4 x 1/2 = 2mks)

- b) Draw a similar diagram to show the effect of temperature on solid carbon (IV) oxide (dry ice) (2mks)



4. Identify the elements present in the following compounds.

- i) Magnesium oxide. (1mk)
Magnesium and oxygen.
- ii) Zinc chloride. (1mk)
Zinc and chlorine
- iii) Sodium sulphate. (1mk)
Sodium, sulphur and oxygen.
- iv) Aluminium nitrate. (1mk)
Aluminium, nitrogen and oxygen

5. State three differences between luminous and non luminous flame. (3mks)

Luminous

- **Burns quietly**
- **Has four zones**
- **Large and wavy.**
- **Produce a lot of soot.**
- **Fairly hot.**
- **Bright yellow in colour.**
- **Produce a lot of light**

Non-luminous

- **Burns with a roaring sound.**
- **Has three zones.**
- **Short and steady.**
- **Does not produce soot.**
- **Very hot.**
- **Pale blue in colour.**
- **Produce less light.**

6. The diagram below shows the effect of heat on hydrated copper (II) sulphate crystals.

a) State the colour of hydrated copper (II) sulphate crystals. (1mk)

Blue

b) What observations are made inside the boiling tube after heating has taken place? (1mk)

- **Blue hydrated copper (II) sulphate changes colour to white.**
- **A colourless liquid collect at the cooler parts of the boiling tube.**

c) What is the use of ice-cold water in the beaker? (½ mk)

- **To condense the vapour to liquid water.**

d) Name liquid Y. (½ mk)

- **Water**

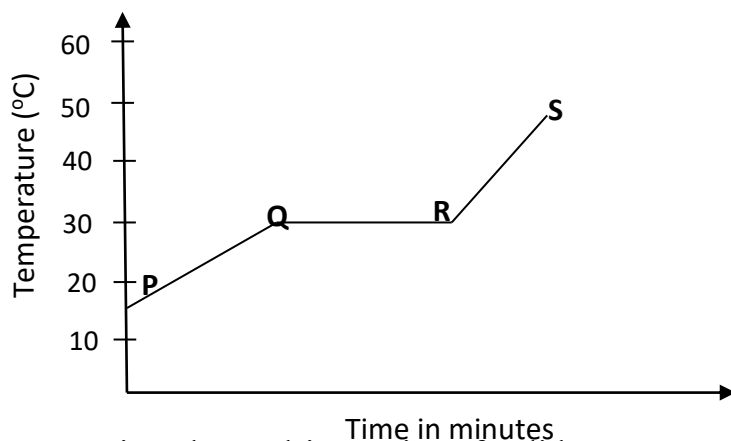
e) What will be observed if the residue in the boiling tube is cooled and a few drops of liquid Y added to it? (1mk)

- **The white anhydrous copper (II) sulphate will change to blue.**

f) What type of chemical change is exhibited by copper (II) sulphate? (1mk)

Temporary chemical change.

7. The graph below shows the shape of the curve obtained by a student when solid X was heated to boiling.



- a) Determine the melting point of solid X. (1mk)
30°C.
- b) After the experiment the student concluded that substance x was pure substance. Explain why he concluded so. (1mk)
 - **The melting point of the substance was sharp.**
- c) If candle wax was used in the above experiment the portion QR would be horizontal. What does this tell us about candle wax? (1mk)
Candle wax is not pure substance, it is made up of mixture of substances.
8. (a) What is the effect of impurities on the melting and boiling point of substances?
 - **impurities lower the melting point of pure substances and it raises the boiling point of substances.**
- (b) Explain the following:
- i) During extraction of metals from their molten compounds for example calcium chloride is added to rock salt during the extraction of sodium from sodium chloride. (1mk)
Calcium chloride is added as an impurity to lower the melting point of sodium chloride hence making the process economical.
- ii) In temperate countries there is spreading of common salt in the roads during winter. (1mk)
Common salt lowers the melting point of ice.
9. Distinguish between temporary physical and permanent chemical changes. (2mks)
- | <u>Temporary physical</u> | <u>Permanent chemical</u> |
|---|--|
| 1. No new substance is formed | 1. New substances are formed |
| 2. Change is easily reversible. | 2. Change is irreversible. |
| 3. No change in mass | 3. There is change in mass. |
| 4. Heat energy is not absorbed or evolved. | 4. Heat energy is absorbed or evolved |
10. (a) Write the names of the elements represented by symbols.
 i) K – **potassium**

- ii) Cl – **chlorine**
- iii) Fe – **iron**
- iv) Mg – **magnesium.**
- v) C – **carbon**
- vi) Be – **beryllium.**

(b) Define:

- i) Atom. (1mk)
Is the smallest particle of an element which can take part in chemical change.
- ii) Compound. (1mk)
A pure substance made up of two or more elements chemically combined.
- iii) Element. (1mk)
A pure substance which cannot be split into simpler substance by chemical means

11. (a) Complete the following. (3mks)

- i) Acid + metal → **salt + Hydrogen**
- ii) Acid + Base → **Salt + Water**
- iii) Acid + Carbonate → **Salt + Carbon (IV) oxide + Water**

(b) Write word equations for the following reactions.

- i) Zinc and hydrochloric acid. (1mk)
Zinc + Hydrochloric acid → Zinc chloride + Hydrogen
- ii) Potassium hydroxide and sulphuric (VI) acid. (1mk)
Potassium + Sulphuric (VI) → Potassium + water
hydroxide acid sulphate
- iii) Magnesium carbonate and nitric (V) acid. (1mk)
Magnesium + Nitric (V) acid → Magnesium + Carbon + Water
Carbonate nitrate (IV) oxide

12. Study the diagram below for the reaction between sodium carbonate and hydrochloric acid and answer the questions that follow.

- a) Explain what was observed in:
 - i) Test tube A. (1mk)
- **Effervescence took place / bubbles of gas produced.**
- **A colourless gas was produced.**

- ii) Test tube B. (1mk)
Calcium hydroxide (lime water) formed a white precipitate.

- b) Write a word equation for the reaction which took place in test tube A. (1mk)



13. State whether solutions with the following pH values are acidic, basic or neutral. (2mks)

pH 3 – **Acidic**

pH 11 – **Basic**

pH 14 – **Basic**

pH 7 – **Neutral**

14. Is air a mixture or a compound? Explain. (2mks)

- **A mixture** ✓ (1mk)

- **Its components are gases which can be separated by physical means.**

15. The apparatus below were used to determine the volume of oxygen in air. About 200cm³ of air were passed repeatedly from syringe A to syringe B over heated copper turnings as shown in the diagram.

After sometime, the volume of air in the syringe A was 160cm³ and syringe B, 0cm³

a) Calculate the percentage of oxygen in the initial sample of air. (2mks)

$$= \frac{(200-160)\text{cm}^3}{200} \times 100\%$$

$$= \frac{40}{200} \times 100$$

$$= 20\%$$

b) The percentage of oxygen calculated above was slightly less than the percentage of oxygen in air. Explain why. (1mk)

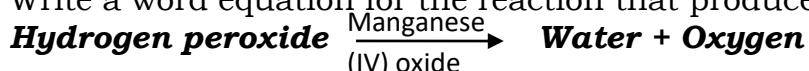
- **Not all oxygen reacted/ was used up**

- **Due to experimental errors.**

16. The set-up below was used to prepare a sample of oxygen gas. Study it and answer the questions that follow.

a) Complete the diagram to show how oxygen can be collected. (2mks)

b) Write a word equation for the reaction that produces oxygen above. (1mk)



c) State two physical properties of oxygen gas. (2mks)

- **Colourless and odourless gas.**

- **Boils at -183°C .**
 - **Slightly soluble in water.**
- d) State two uses of oxygen. (2mks)
- **Used in hospitals by patients with breathing difficulties.**
 - **Used by mountain climbers and deep sea divers.**
 - **Used for welding as oxyhydrogen flame or oxyacetylene flame.**
17. Candle wax is an example of a hydrocarbon.
- a) What is a hydrocarbon? (1mk)
- A compound of carbon and hydrogen only.**
- b) Name the two products formed when hydrocarbons burn in oxygen. (1mk)
- **Carbon (IV) oxide.**
 - **Water.**
18. Study the figure below and use it to answer the following questions.
- a) Name the parts labeled X and Y. (1mk)
- X – almost colourless zone.**
Y – green blue zone.
(½ mk each)
- b) Identify the flame. (1mk)
- Non-luminous**
- c) Which part of the flame is the hottest? (1mk)
- Z – pale blue zone.**
19. The diagrams below show some physical methods of separating mixtures.
- a) Name the methods of separation labeled W, X and Y.
- W – Fractional distillation.**
X – Paper chromatography.
Y – Filtration.