

**CHEMISTRY EXAM  
FORM ONE  
END OF TERM 2**

**MARKING SCHEME:**

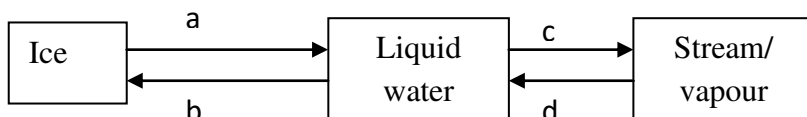
1. Explain why most laboratory apparatus are made of glass. (2mks)
- **Glass is easy to clean.**
  - **Glass does not react with most reagents.**
  - **Glass is transparent hence allow one to see clearly the reactions taking place.**
- (any 2 x 1 = 2mks)

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**

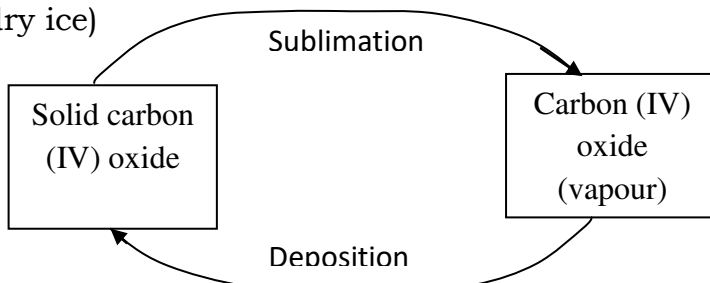
- (c) State two ways of preventing drug abuse. (2mks)
- **Avoid peer pressure.**
  - **Avoid taking drugs without the doctor's advice.**
  - **Avoid taking drugs for pleasure.**
  - **Avoid company of drug users.**

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**

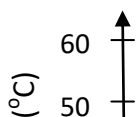
e) What will be observed if the residue in the boiling tube is cooled and a few drops of liquid Y added to it? (1mk)

- **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 counties 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>                    |
|---|--|
| <b>1. No new substance is formed</b>              | <b>1. New substances are formed</b>          |
| <b>2. Change is easily reversible.</b>            | <b>2. Change is irreversible.</b>            |
| <b>3. No change in mass</b>                       | <b>3. There is change in mass.</b>           |
| <b>4. Heat energy is not absorbed or evolved.</b> | <b>4. Heat energy is absorbed or evolved</b> |
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)

**Sodium + Hydrochloric → Sodium + Carbon (IV) + Water  
Carbonate acid chloride oxide**

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 200cm<sup>3</sup> 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 160cm<sup>3</sup> and syringe B, 0cm<sup>3</sup>

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

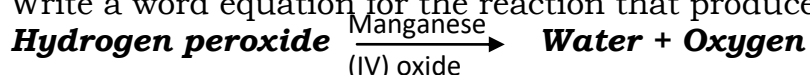
$$\begin{aligned} &= \frac{(200-160)\text{cm}^3}{200} \times 100\% \\ &= \frac{40}{200} \times 100 \\ &= 20\% \end{aligned}$$

- 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.**