TERM 3, 2023

INSTRUCTIONS : Answer All Questions   **TIME : 1Hr 30 Mins**

1.a) Explain why most chemistry apparatus are made of glass (2Mks)

     - Glass are transparent thus enhance visibility M_1

     - Glass do not react with most of the chemicals M_1

   b) State two major causes of accidents in the laboratory (2Mks)

     — Carelessness M_1

     — Ignorance. M_1

2. a) What is a flame (1Mk

     — Mass of burning gases.

   b) Which of the flames produced by the Bunsen burner is preferred for heating?
Give two reasons (3Mks)

     Non -luminous flame. M_1

     — Produces alot of heat. M_1

     — Does not produce soot / Does not darken apparatus. M_1

   c)Give 2 differences between the two types of flames (2Mks)

Luminous.	Non-Luminous
Large & Wavy.	Short & Steady
Has 4 zones	Has 3 zones.
Produces soot	Does not produce soot

Mark any other.

3. Give two examples of :

I. Temporary Physical change (1Mk)

Heating Zinc Oxide ½
Heating Solid iodine ½
~~Heating~~ wax.

II. Temporary Chemical change (1Mk)

Heating Copper (II) Sulphate ½
Heating hydrated Cobalt (II) Chloride. ½

4. State the effect of impurities on the melting and boiling point of a substance (2Mks)

- Lowers melting point I
- Raises boiling point I

5. Name the elements present in the following compounds.

I. Magnesium Nitride (1Mk)

Magnesium ½
Nitrogen ½

II. Sodium Carbonate (1½Mks)

Sodium ½   oxygen ½
Carbon ½

6. From the following list of compounds ; zinc oxide, solid carbon (IV) oxide, sodium carbonate, nitric (v) acid and iron (III) chloride,

I. Identify two that sublimes (1Mk)

Solid Carbon (IV) Oxide ½
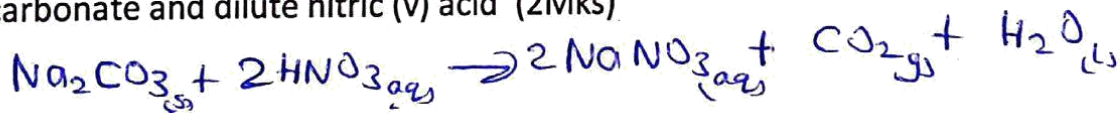Iron (III) chloride ½

II. Identify two that react to form salt and water only (1Mk)

Zinc Oxide ½
nitric (V) acid ½

III. Write a balanced chemical equation for the reaction between sodium carbonate and dilute nitric (v) acid (2Mks)

$$Na_2CO_{3(s)} + 2HNO_{3(aq)} \rightarrow 2NaNO_{3(aq)} + CO_{2(g)} + H_2O_{(l)}$$

7. Dilute sulphuric (VI) acid was added to a compound of magnesium P. The solid reacted with the acid to form a colorless solution Q and a colorless gas R which formed a white precipitate when bubbled through lime water.

a) Name:

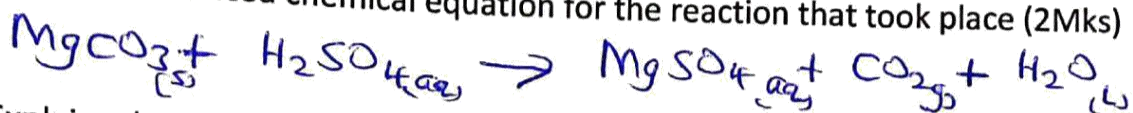I. Compound P (½Mk)   Magnesium Carbonate.

II. Solution Q (½Mk)

Magnesium Sulphate.

III. Colorless gas R (½Mk)

Carbon (IV) oxide.

b) Write a balanced chemical equation for the reaction that took place (2Mks)

$$MgCO_{3(s)} + H_2SO_{4(aq)} \rightarrow MgSO_{4(aq)} + CO_{2(g)} + H_2O_{(l)}$$

8. Explain why a mixture of copper (II) oxide and magnesium reacts when heated while there is no reaction when a mixture of copper and magnesium oxide is heated (2Mks).

Magnesium has a higher affinity for combined oxygen than copper hence removes oxygen from the copper (II) oxide. Copper is below Magnesium in the reactivity series hence cannot reduce MgO.

9. a) Is air a mixture or a compound. Explain (2Mks)

Mixture m,
It can be separated into its constituents such as oxygen, nitrogen etc by fractional distillation. m,

b) Explain why cars in the coastal city of Mombasa rusts faster than cars in Kisumu city (2Mks)

Mombasa is adjacent to the indian ocean, the ocean salt combines the moisture (humidity) resulting to corrosion.

10. a) Name the products formed when kerosene is burned in air (2Mks)

- Carbon (IV) oxide ½
- Water ½

b) State two observations when a small piece of sodium is placed in water (2mks)

- Melts into a silvery ball m,
- Darts on the surface of water. m,
- Produces a fizzing sound.

11. Distinguish between the following terms:

a) Atomic number and Mass number (2Mks)

- Atomic number is the number of Protons in the nucleus of an atom m,
- Mass number is the sum of protons and neutrons in the nucleus of an atom. m,.

b) Valency and Radicals (2Mks)

- Valency is the number of electrons gained or lost by an atom. M₁
- Radicals are group of atoms with a net charge that exist and react as a unit during chemical reactions. M₁

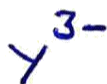12. An atom is said to be electrically neutral. Explain (1Mk)

Number of protons equals number of electrons.

13. An element Y has an electron arrangement of 2.8.5.

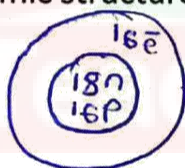I. State the period and group which the element belongs (2Mks)

Group (V)
Period 3

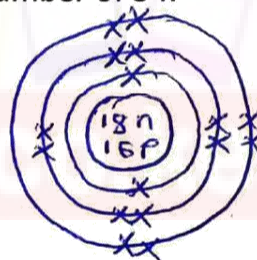II. Write the formula of the most stable ion formed when the element Y ionizes (1Mk)

Y^{3-}

14. An isotope Q has 18 neutrons and a mass number of 34.

a) Draw the atomic structure of A (2Mks)

b) Write it's electron configuration (1Mks)

2·8·6

c) How does Q form it's ion? Explain (2Mks)

By gaining 2 electrons. Q is a non-metal and thus gains 2 electrons to attain a stable electron arrangement of 2·8·8

15. a) What is the test for hydrogen gas (1Mk)

Puts off a burning splint with a pop sound.

b) State two uses of hydrogen gas (2Mks)

- Manufacture of ammonia in haber process.
- Used in balloons as it is lighter than air
- Used in rocket fuel,
- Used in the manufacture of hydrochloric acid.
- Mark any other