**CHEMISTRY FORM TWO**

**MARKING SCHEME:**

1. Fractional distillation of liquid air is usually used to separate various gaseous mixtures in air. Explain how to;
2. Remove carbon (IV) oxide. (1mk)

***Passing air through concentrated sodium hydroxide or potassium hydroxide solution.***

1. Remove water. (1mk)

***Cool to -25oC to remove water.***

1. Obtain nitrogen. (1mk)

***Cool to -200oC and carry out fractional distillation to obtain nitrogen gas.***

1. The diagrams below represent two iron nails with some parts covered tightly with zinc and tin respectively. What observations would be made at the exposed points R and Z if the wrapped nails are left in the open for several days? Explain.

*At R:* ***No rusting occurred √½ . Zinc is more reactive than iron hence it reacts with moist air instead of iron√****1****.***

*At Z:* ***Rusting occurred √ ½. Tin is less reactive than iron hence iron reacts with moist air to form rust.√1***

1. The Diagram below is set-up for the laboratory preparation of oxygen gas.

*Diagram*

1. Name solid R

***Manganese (IV) oxide. √1***

1. Write an equation for the reaction that takes place in the flask. (2mks)

Manganese IV oxide

***2H2O2(l) O2(g) + 2H2O(l) + 2H2O(l)***

1. Give one commercial use of oxygen. (1mk)
* ***Welding***
* ***Steel making***
* ***Breathing aid/ hospitals***

*Accept any.*

1. An element y has an electron arrangement of 2.8.5
2. State the period and group which the element belongs. (2mks)

***Group V***

***Period 3***

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

***Y 3-***

1. Explain the difference between the atomic radius of element Y and its ionic radius (2mks)

***The ionic radius is larger because of the electron-electron repulsion between the existing electrons and the added electron.***

1. Lithium has two isotopes with mass numbers 6 and 7. If the R.A.M (relative atomic mass) of Lithium is 6.94, determine the percentage abundance of such isotope.

 ***6x + 7y = 694***

 ***(x + y = 100)6***

 ***6x + 7y = 694 \_***

 ***6x + 6y = 600***

 ***y = 94%***

 ***x = 6%***

1. Other than their location in the atom, name two other differences between an electron and a proton.(2mks)

***Electron – Negative charge***

***Proton – Positive charge***

1. Write down the electronic configuration of the atoms with the following atoms with the following atomic numbers(2mks)
2. 7 -  ***2.5***
3. 9 - ***2.7***
4. 14 - ***2.8.4***
5. 18 - ***2.8.8***
6. An atom of an element has the electronic configuration 2.8.2
7. State its atomic numbers

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1. To which group of the periodic table does it belong? Explain.

***Group 2. It has two electrons in its outermost energy level.***

c) Is the element a metal or a non-metal? Explain (1mk)

 ***A metal. It has less than 4 electrons in its outermost energy level.***

d) If the atom has 14 neutrons in its nucleus state its mass number. (1mk)

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1. Rubidium (Rb) is a member of the alkali metals. Predict how the element reacts with: (3mks)
2. Water -  ***vigorously***
3. Air - ***vigorously***
4. Chlorine - ***less vigorously***
5. Briefly explain the following observations.
6. Noble gases are generally unreactive. (1mk)

***Noble gases are chemically stable because their outer energy level are full.***

1. Alkaline earth metals are generally less reactive than alkali metals in the same period. (2mks)

***Alkali metals react by losing the one electron from their outermost energy level.***