**MWAKICAN EXAMINATION**

**END TERM 1 2015**

**CHEMISTRY FORM 2**

**TIME 2 Hrs**

NAME: …………………………………………………………… ADM NO: ……………….. CLASS: …….

*Instructions to candidates: Answer All Questions in the Spaces Provided*

1. 1. Two elements R and Q have their ionic configuration 2:8 and 2:8:8. They are found in group I and group 7 respectively in the periodic table. Write down the electronic configuration of their atoms;
      1. Q [1 Mark]
      2. R [1 Mark]
   2. Write the formula of the compound formed when R and Q combine. [1 Mark]
2. The table below shows the atomic numbers of element of the periodic table represented by the letters A to H.

(the letters are not the actual symbols for the elements)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Element | A | B | C | D | E | F | G | H |
| Atomic number | 3 | 7 | 8 | 9 | 11 | 12 | 13 | 14 |

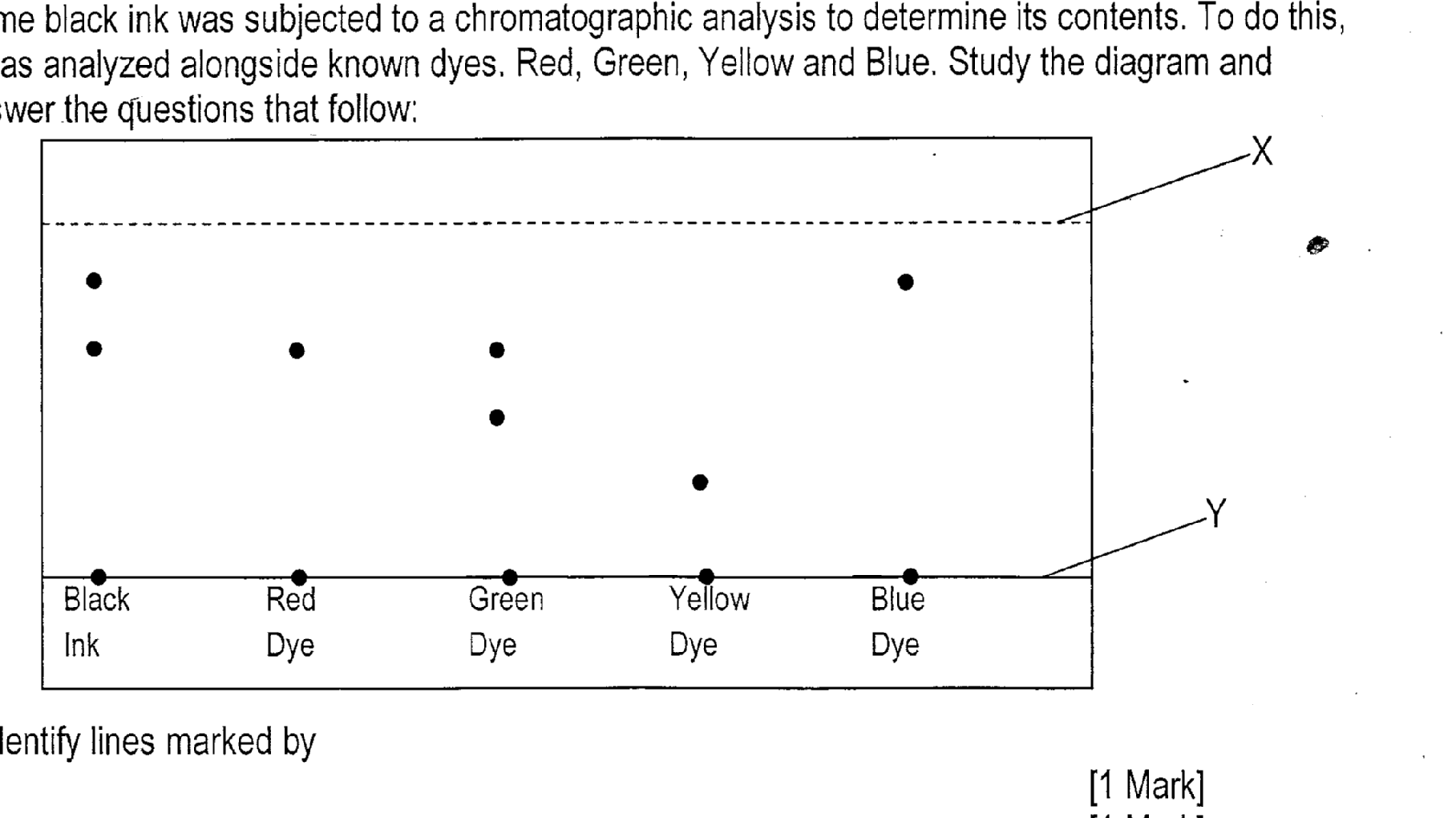
* + 1. Select 2 elements that would form ions with electronic configuration. (2:8) [2 Marks]
    2. Select 2 elements which belong to the same group. [2 Marks]
    3. Select one non-metal and one metal from the above table
       - * Non-metal [1 Mark]
         * Metal [1 Mark]
    4. Give the name of the group to which element E belongs in the periodic table. [1 Mark]
    5. Using dots (**.**) or crosses (x), draw a diagram to show how electrons are distributed in energy levels in Element G. [2 Marks]
    6. What is meant by the term “Isotopes”? [1 Mark]
  1. The table below shows the PH values of some solutions.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Solution | A | B | C | D | E |
| PH | 6.0 | 13.0 | 2.0 | 10.0 | 7.0 |

1. Which solution is likely to be
   * 1. Strong base [1 Mark]
     2. Neutral Solution. [1 Mark]
2. What is the chemical name given to the process that occurs when solutions B and C react together? [1 Mark]
3. Give 2 examples of solution A. [2 Marks]
4. What are acid-base indicators? [1 Marks]
   1. Give examples of 2 acid-base indicators and state their colour changer in acidic and basic solutions. [2 Marks]

|  |  |  |
| --- | --- | --- |
| Indicator | Colour in Acid | Colour in Base |
|  |  |  |
|  |  |  |

1. 1. Describe what is meant by Electroplating. [1 Mark]
   2. Give two reasons for Electroplating [2 Marks]
2. 1. Hydrogen is prepared in the laboratory by the action of dilute Hydrochloric Acid on Zinc granules.
      1. Explain why Nitric (v) acid is not suitable in preparation of Hydrogen gas. [1 Mark]
      2. Give any suitable drying agent of Hydrogen gas. [1 Mark]
      3. What is the chemical name of the catalyst that is used in this experiment? [1 Mark]
      4. Other than hydrogenation, state 2 uses of Hydrogen gas. [2 Marks]
3. 1. Is air a mixture of a compound? Explain [2 Marks]
   2. Name three factors that accelerate rusting. [3 Marks]
4. Some black ink was subjected to a chromatographic analysis to determine its contents. To do this, it was analyzed alongside known dyes. Red, Green, Yellow and Blue. Study the diagram and answer the questions that follow:



* 1. Identify lines marked by
     1. X [1 Mark]
     2. Y [1 Mark]
  2. Which of the dye is most absorbed to the absorbent material? Explain. [2 Marks]
  3. Which dye is not found in the black ink? [1 Mark]
  4. Give one application of chromatography. [1 Mark]

1. The table below gives the number of electrons, protons and neutrons in particles A,B,C,D,E,F and G. (letters are not actual symbols of elements)

|  |  |  |  |
| --- | --- | --- | --- |
| Particle | Protons | Electrons | Neutrons |
| A | 6 | 6 | 6 |
| B | 10 | 10 | 12 |
| C | 12 | 10 | 12 |
| D | 6 | 6 | 8 |
| E | 13 | 10 | 14 |
| F | 17 | 17 | 18 |
| G | 8 | 10 | 8 |

* + 1. Which particle is likely to be a halogen? [1 Mark]
    2. What is the mass number of element E? [1 Mark]
    3. What is the formula of the most stable ion of element C? [1 Mark]
    4. Write the formula of the compound formed when E combines with G [2 Marks]
    5. Why do particle B not react with particle D? [2 Marks]
    6. How does the atomic radii of C compare with its ionic radius? [2 Marks]
    7. Explain why the 1st ionization energy in element C is less than 2nd ionization energy? [3 Marks]

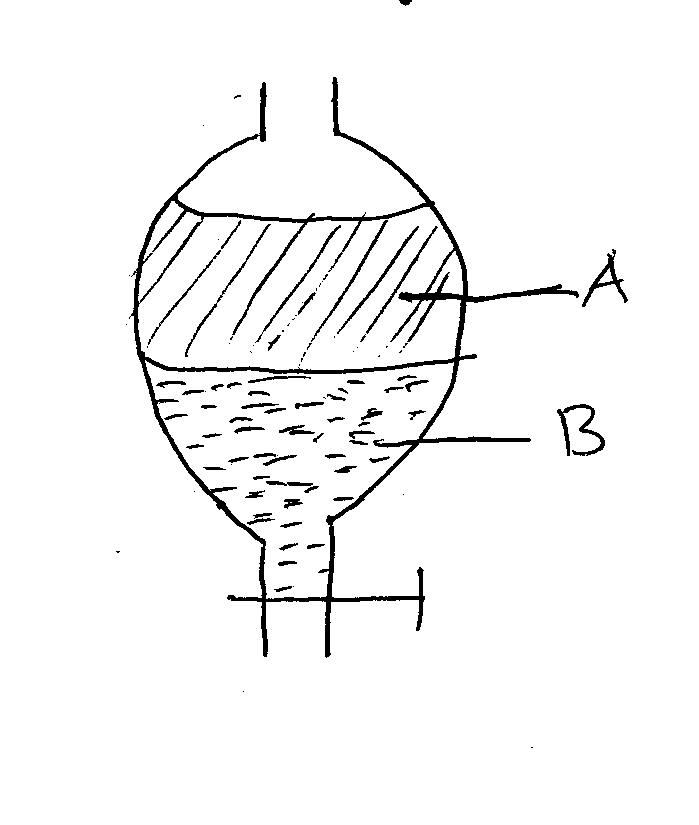
1. Study the information in the table below.

|  |  |  |
| --- | --- | --- |
| Ions | Electron  Arrangement | Ionic  Radius |
| Na+ | 2.8 | 0.133 |
| K+ | 2.8.8 | 0.95 |
| Li+ | 2 | 0.065 |

* + 1. Explain why the ionic radius of Na+ is greater than that of Na+ [2 Marks]
    2. The shown ions have their corresponding atoms as follows: Na, K, Li. How does their reactivity down the group compare? [2 Marks]
    3. What is the chemical name of the family where Na+,K+,Li+ belong? [1 Mark]
    4. The number of neutrons in ion of Na+ is 12, determine its mass number of its atom. (Na)

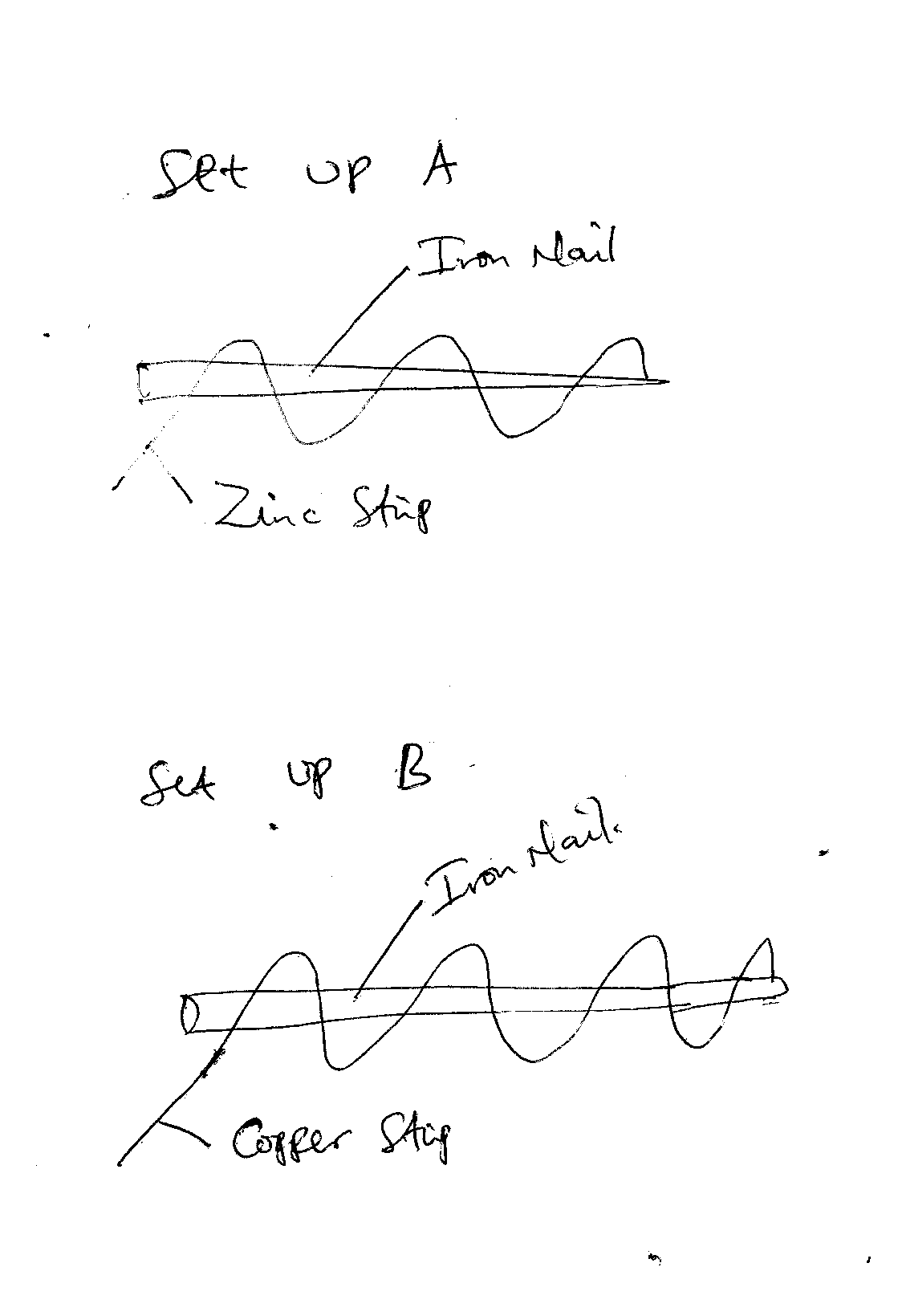
[1 Mark]

1. A mixture of kerosene, methylbenzene and water were shaken and left to separate out as shown in the diagram below.



* + 1. Identify liquids A and B [2 Marks]
    2. Apart from density, state one property that makes it possible to separate them using the set up above? [1 Mark]

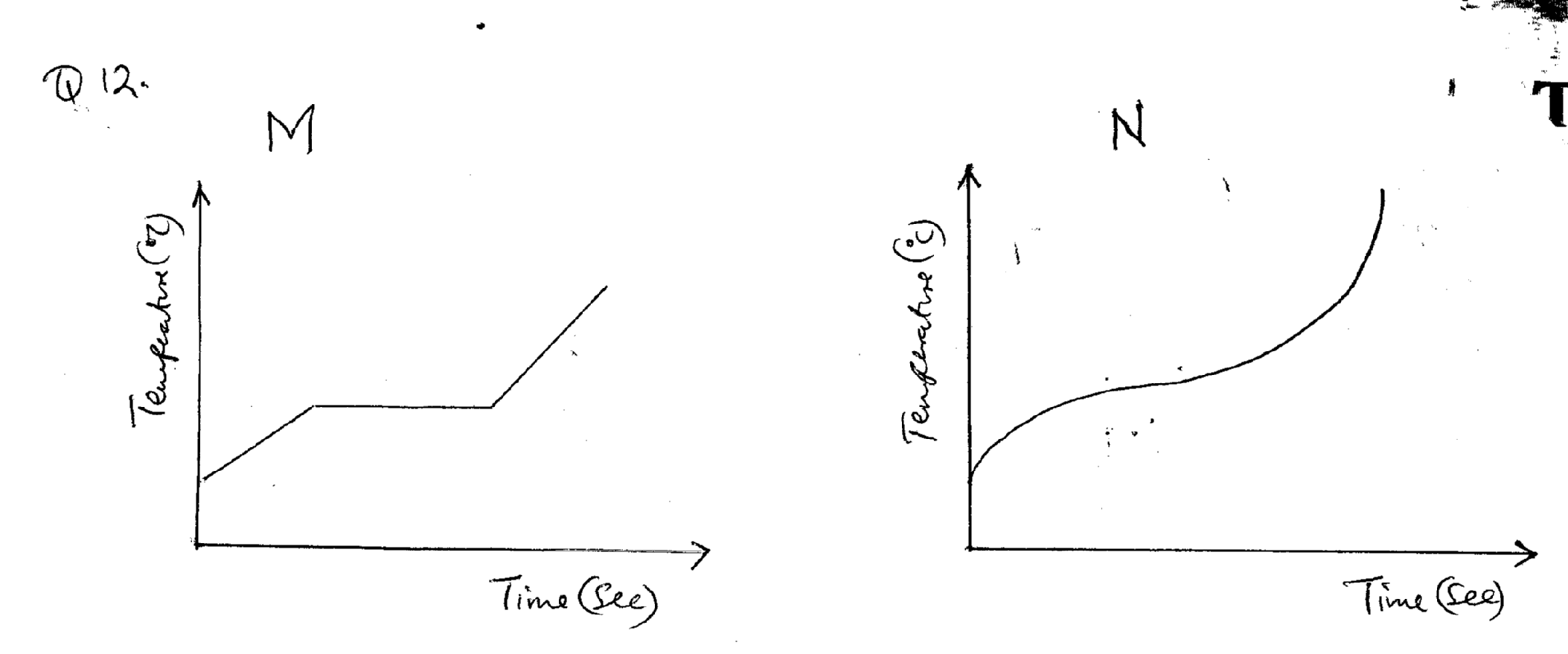
1. Use the diagram below to answer the questions that follow.



* 1. In which set up will the iron nail rust? Explain. [2 Marks]
  2. What is the name given to the above method of preventing rusting? [1 Mark]
  3. What is the chemical name of rust? [1 Mark]
  4. Apart from the above method named in Q10, (b). give any other 2 methods of preventing rusting

[2 Marks]

1. The diagram below represents the temperature –time curve for solids M and N.

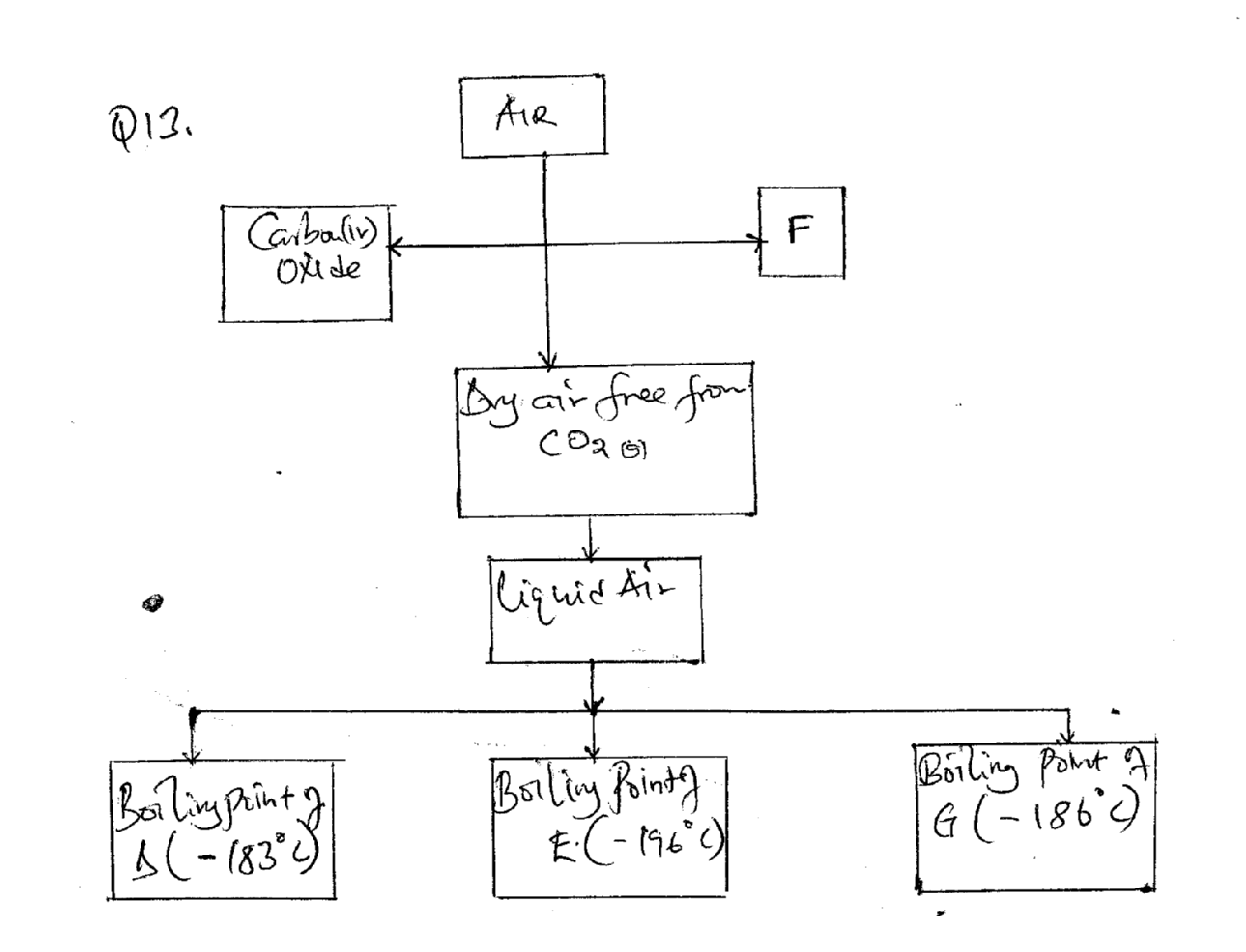


* 1. What is the name given to the curves above? [1 Mark]
  2. Which of the two solids is an impure substance? Explain. [2 Marks]
  3. Define what is meant by “heat of vaporization”? [1 Mark]



The R.A.M of element P is 63.5. it has 2 isotopes of masses 63 and 65 respectively. Determine the percentage abundance of each isotope. [3 Marks]

* 1. The flow chat below is a summary of fractional distillation of air.



* + 1. Explain how Co2 is removed in step I [1 Mark]
    2. State the form in which F is removed. [1 Mark]
    3. Identify products D and E [2 Marks]
  1. 1. Explain how dust particles are removed. [1 Mark]
     2. Give 2 substances used to remove Co2 from air. [2 Marks]
     3. Give one use of substance G. [1 Mark]

1. * 1. What is sublimation? [2 Marks]
     2. Name 3 substances that undergo sublimation. [3 Marks]
     3. A student was supplied with a colourless liquid and suspected to be water. Describe 2 chemical tests that could be carried out to show that the liquid was water. [2 Marks]
     4. Write chemical symbols of the following elements. [2 Marks]

Neon

Aluminium

1. 1. Write the chemical formula for the following compounds. [5 Marks]
      1. Calcium Fluoride
      2. Aluminium Sulphate
      3. Sodium Carbonate
      4. Carbon (iv) oxide
      5. Potassium Nitrate
   2. Balance the following equations;
      1. Mg(s) + Hcl(aq) MgCl2(aq)+H2(g) [2 Marks]
      2. NaOh(aq)+H2So4(aq) Na2So4(aq)+H2O(l) [2 Marks]
   3. Write a balanced equation for each of the following reactions. [1 Mark]

Action of dilute Hydrochloric Acid on Zinc metal.

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