Chemistry

1- Which of the following solutions has the highest boiling point?

  a- Sodium carbonate solution of concentration 1M.

  b- Sodium carbonate solution of concentration 2M.

  c- Iron (III) chloride solution of concentration 1M.

  d- Iron (III) chloride solution of concentration 2M.

2- The total number of atoms in a half mole of formaldehyde HCHO equals:

  a- Avogadro's number.

  b- A half of Avogadro's number.

  c- Double Avogadro's number.

  d- A quarter of Avogadro's number.

3- When 55.5 g of calcium chloride $CaCl_2$ was dissolved in 0.5 L of water, so the concentration of the solution is: (Ca = 40 , Cl = 35.5).

  a- 1 M

  b- 0.5 M

  c- 2 M

  d- 1.5 M

4- When performing experiments to find the molecular formula of a compound, the percentage of element A was 40%, and element B was 12%. If you know that   (A= 40, B = 12, C = 16). The molecular formula of this compound is:

  a- ABC_3

  b- A_3BC

  c- AB_3C

  d- A_2B_2C

5- The given graph shows the relation between the degree of solubility of some materials and the temperature of the solvent. Which of the following materials whose solubility increases more by increasing the temperature of the solvent?

degree of solubility (g/100g)

(c°) Tempreture
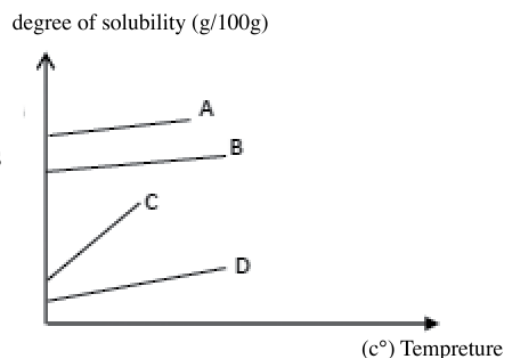
a- B

b- A

c- C

d- D

6- In the diagram below: If the solutions are of the same concentration, so the solutions that are marked by the numbers (2, 1) successively are:

Boiling Point (c°)

No. of moles/litre
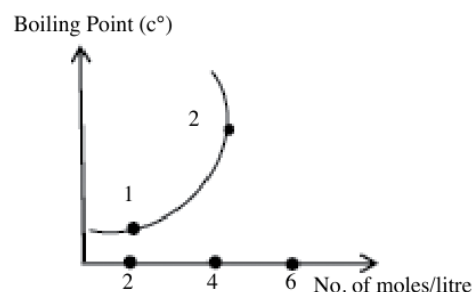
a- Sodium chloride solution and glucose sugar solution.

b- Sodium chloride solution and aluminum nitrate solution.

c- Potassium carbonate solution and aluminum nitrate solution.

d- Potassium carbonate solution and glucose sugar solution

7- By using the following radicals:
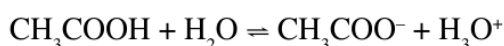
$CH_3COO^- - 4 \ SO_4^{2-} - Na^+ - NH_4^+$

Conclude the chemical formula of a compound whose solution has pH value greater than (7).

8- Arrange the following acids ascendingly according to their basicity.

$H_3BO_3 - HCN - H_2SO_3$

9- Conclude the conjugated acid and the base, according to the BrÖnsted-Lowry's theory in the following equation:

$CH_3COOH + H_2O \rightleftharpoons CH_3COO^- + H_3O^+$
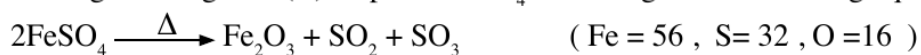
10- In the following graph:

Solubility percentage

Concentration (1mol/L)
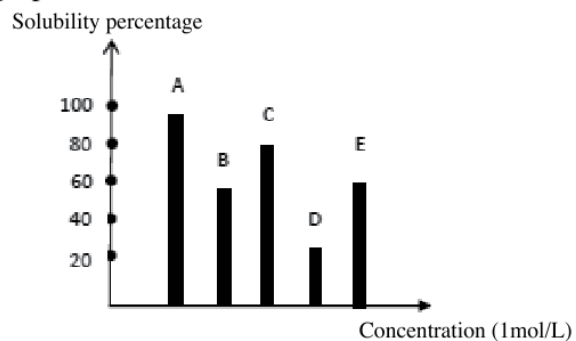
Which of the columns (A, B, C, D, or E) that are labelled on the graph represents the ionization of an organic acid in water?

11- Calculate the number of moles of iron (III) oxide Fe_2O_3 that are produced by heating of 456 g iron (II) sulphate $FeSO_4$ according to the following equation :

$2FeSO_4 \xrightarrow{\Delta} Fe_2O_3 + SO_2 + SO_3$ (Fe = 56 , S= 32 , O =16)

12- The following graph illustrates the relation between (the amount of magnesium that reacts with hydrochloric acid) versus (time of reaction). Conclude the time in which a half of the magnesium amount is consumed in this reaction.