INDIAN SCHOOL SOHAR

UNIT TEST 2015-2016

CHEMISTRY

STD: XII | MARKS: 50

Date:19-05-2015 | TIME: 2 Hrs

Instructions:

1. *All questions are compulsory.*
2. *Question nos. 1-3 arevery short answer questions and carry 1 mark each.*
3. *Question nos. 4-6are short answer questions and carry 2 marks each.*
4. *Question nos.7-15 are short answer questions and carry 3 marks each.*
5. *Question no. 16 is short answer questions and carry 4marks.*
6. *Question nos. 17-18 are long answer questions and carry 5 marks each.*
7. *Write serial no. of the question before attempting it.*
8. *Use log tables for calculations.*

---

1. Write the structure of 4-tert-Butyl-3-iodoheptane.
2. Unlike dry cell, mercury cell have a constant cell potential throughout its life. Why?
3. A reaction is of second order with respect to a reactant. How is the rate of reaction affected if the concentration of the reactant is reduced to half?
4. An aqueous solution of2% non-volatile solute exerts a pressure of 1.004 bar at the normal boiling point of the solvent. What is the molar mass of the solute?(R = 0.083 Lt-bar-$K^{-1}mol^{-1}$)

   OR

   Vapour pressure of water at 293K is 17.5 mm Hg. Calculate the vapour pressure of water when 25g of glucose is dissolved in 450g of water. (Atomic mass of H=1, C=12, O=16 $gmol^{-1}$)
5. Write the Nernst equation and calculate emf of the following cell at 298K :

   $Mg(s)\ /Mg^{2+}(10^{-3}M)\ llCu^{2+}(10^{-4}M)\ /Cu(s)$

   given $E^{o}_{Mg^{2+}/Mg} = -2.36V$; $E^{o}_{Cu^{2+}/Cu} = +0.34V$; $1F = 96500 coul\ mol^{-1}$.
6. How will you bring about the following conversions?

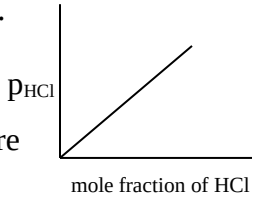
   a) Ethane to bromoethene b) But-1-ene to but- 2-ene
7. a) Why are alkyl halides insoluble in water?

   b) What are the conditions for a substance to be optically active?

   c) Which is optically active ? Butan-1-ol or Butan-2-ol.
8. Define the term molar conductivity and explain how molar conductivity changes with concentration of solution for weak and strong electrolytes.
9. a) Which law is illustrated by the graph? Give its mathematical expression.

   b) Give one application of the above law.

   c) What is the effect of temperature on K_H?



10. What is Raoults law? Explain why the law does not hold good for a mixture of ethanol and cyclohexane? Represent it graphically.

11. The rate constant for a 1^{st} order reaction is $60s^{-1}$. How much time will it take to reduce the initial concentration of the reactant to $1/10^{th}$ of its initial value?

12. a) Define i) half life period of a reaction ii) Rate of a reaction.
    b) Derive the general expression for the half life of a first order reaction.

13. a) Explain how the vapour pressure of a solvent is affected when a non-volatile solute is dissolved in it.
    b) Calculate the molarity of 9.8% (w/w) solution of H_2SO_4 if its density is $1.02gml^{-1}$
    c) What type of azeotrope is formed by negative deviation from Raoult'slaw ? Give an example.

14. Why do we sometimes get abnormal molecular mass for solutes using colligative properties? Explain with examples.

15. Differentiate between order and molecularity of a reaction.

OR

How does temperature and presence of a catalyst affect the rate of a reaction? Explain and represent it graphically.

16. Two solutions having same osmotic pressure at a given temperature are called isotonic solutions. The osmotic pressure associated with fluid inside the blood cell is equivalent to that of 0.9% (w/v)
    a) What precaution should be taken when saline is given intravenously to patients by doctors.
    b) What will happen if hypotonic solution is injected into our body?
    c) What will happen if hypertonic solution is injected into our body? What is the solution to this problem?

17. a) Explain the mechanism involved in nucleophilic substitution reaction of alkyl halides by S_N2 reaction.
    b) Why does S_N2 reaction take place by inversion in configuration?
    c) Which kind of alkyl halides undergo S_N2 reaction readily and why?

OR

    a) Write chemical equations when
        i) ethyl chloride is treated with aqueous $AgNO_2$
        ii) chlorobenzene is treated with CH_3COCl in presence of anhydrous $AlCl_3$.
    b) Explain why alkyl halides undergo nucleophilic substitution reactions whereas aryl halides undergo electrophilic substitution reactions.
    c) Which is more readily hydrolysed and why? $CH_3CHClCH_2CH_3$and $CH_3CH_2CH_2CH_2Cl$

18. a)What are fuel cells? Give an example and write the reactions taking place at the electrodes.
    b) Write the reactions taking place at the electrodes for the following cells
        i) mercury cell ii) dry cell iii) lead storage cell

OR

    a) Define corrosion
    b) Explain the electrochemical theory of rusting of iron giving all the reactions taking place.
    c) Explain sacrificial protection for prevention of rusting of iron.

---oOo---