Class 12                                                                                          Time : 1 hr.
12-8-2016                          Second Unit Test (First Term) in CHEMISTRY          M. Marks : 20

1.      State Henry's law.  Give one application of the law.                                    (1)

2.      a)      A and B liquids on mixing produces a warm solution.  What type of deviation
                from Raoult's law is there ?
        b)      Give one application of Reverse Osmosis.                                        (1)

3.      "The solution of a non-volatile solute boils at a higher temperature than the pure solvent".
        State this relationship on a graphic diagram.                                           (1)

4.      Differentiate between order and molecularity of a reaction.                             (1)

5.      a)      Complete the reaction :
                $CH_3CH = C(CH_3)_2 + HBr \xrightarrow{\text{peroxide}}$
        b)      What are enantiomers ?                                                          (1)

6.      a)      Calculate the half-life of a first order reaction if rate constant is 200 $s^{-1}$.
        b)      What is meant by threshold energy?  How is it related to average energy
                possessed by the molecules?                                                    (2)

7.      Give chemical equations (only) to explain the following reactions:
        a)      Swarts reaction                    b)      Fittig reaction                      (2)

8.      a)      Haloarenes are less reactive towards nucleophilic substitution reaction.
                Give any two reasons.
        b)      Arrange the following compounds in the increasing order of reactivity towards
                $SN^2$ replacement.
                        1-bromobutane,   1-bromo-2, 2-dimethyl propane,
                        1-brome-2-methyl butane,   1-bromo-3-methyl butane                      (2)

9.      How will you bring about the following conversions?
        a)      But – 1 – ene    to     But – 2 – ene
        b)      Toluene    to    Benzyl alcohol
        c)      Benzene    to    4-bromo nitrobenzene                                           (3)

10.     a)      Define van't Hoff factor.
        b)      200 $cm^3$ of an aqueous solution of a protein contain 1.26g of the protein.
                The osmotic pressure of such a solution at 300 K is found to be 2.57 x $10^{-3}$ bar.
                Calculate the molar mass of the protein.   R = 0.083 L barmol$^{-1}$ K$^{-1}$.  (3)

11.     The rate of a reaction quadruples when the temperature changes from 293K to 313K.
        Calculate the energy of activation assuming that it does not change with temperature.
        R = 8.314 K kg mol$^{-1}$.                                                              (3)

                                        -x-x-x-x-x-