FIITJEE INTERNAL TEST

C.B.S.E. TEST – IV

CHEMISTRY

Class – XII

Maximum Marks: 30 **Time Allowed: 1 hour**

General Instructions:

(i) There are 11 questions in all. All Questions are compulsory.

(ii) This question paper has four sections: Section A, Section B, Section C and Section D.

(iii) Section A contains four questions of two marks each, Section B contains two questions of three marks each, Section C contains two question of five marks each. Section D contains one paragraph having 3 objective single correct type questions, of two marks each.

(iv) You may use log tables if necessary but use of calculator is not allowed.

SECTION-A

Very short answer type

1. What is instantaneous rate and initial rate?

2. What is a catalyst? How does it enhance the rate of a reaction?

3. Equal volumes of sea water and distilled water are kept in two beakers. Which will evaporate faster? Explain.

4. A dilute solution is separated from a more concentrated solution containing the same solvent by a semipermeable membrane. In which direction does the solvent tend to flow across the membrane and why?

SECTION-B

Short answer type

5. For the reaction $NO + NO_2 + H_2O \longrightarrow 2HNO_2$, the rate does not depend on the concentration of H_2O and, if the concentration of NO or NO_2 is doubled, the rate doubles. Write the rate law for the reaction.

6. What is van't Hoff factor? What is its significance? What is its value when association or dissociation occurs?

SECTION-C

Long answer type

7. Consider three reactions with different activation energies and ΔE.
   Reaction 1: E_a = 40 kJ mol^{-1}; ΔE = -15 kJ mol^{-1}
   Reaction 2: E_a = 30 kJ mol^{-1}; ΔE = -60 kJ mol^{-1}
   Reaction 3: E_a = 10 kJ mol^{-1}; ΔE = +25 kJ mol^{-1}
   (a) Sketch a potential energy curve for each of them showing reactants, products and transition state.
   (b) Assuming that all the three reactions are carried out at the same temperature and have the same value of pre-exponential factor A, which of the them is the fastest?
   (c) Which reaction is the most endothermic and which is the most exothermic?

8. The vapour pressure of water is lowered by 7.9 torr in the presence of a non volatile solute A. If the vapour pressure of pure water is 23.7 torr, what is the mole fraction of the solute?

SECTION-D

Comprehension Type
Paragraph for question nos. 9 – 11

The colligative properties of solutions of non-volatile solutes depends on the concentration of solution, which is expressed in molality. These properties depends on the number of particles formed from the solutes upon ionization or association. The size and other parameters of the particle have no contribution to the colligative properties.

9. What is the molality of 14 g of NaOH in 2000 g of water?
   (A) 0.002 (B) 5×10^{-5}
   (C) 2 (D) 0.05

10. A solution is said to show positive deviation from Raoult's law if
   (A) it shows a minimum in the plot of vapour pressure as a function of mole fraction
   (B) it shows a maximum in the plot of vapour pressure as a function of mole fraction
   (C) it shows a minimum in the plot of temperature as a function of mole fraction
   (D) it shows a maximum in the plot of temperature as a function of mole fraction

11. Colligative properties are those properties that depend on the
   (A) nature of the solute (B) size of the solute particles
   (C) nature of the solvent (D) number of solute particles