PHYSICAL CHEMISTRY - III

Semester - II
(Common with B.Sc. Bio Tech.)

Time Allowed : 3 Hours] [Maximum Marks : 26

Note : Attempt *two* question each from Section A and B, and the entire Section C.

Section - A

1. What do you mean by depression in freezing pont ? Derive thermodynamically the relation between molecular weight of solute and depression in freezing point. 4
2. (a) State and explain Rault's law for solution containing non-volatile solute. 2
   (b) Calculate the osmotic pressure of 200 mL of solution containing 70 g of urea at 20°C. Given R = 0.0821 atm LK^{-1} mol^{-1}. 2
3. State and explain Hardy-Schulze Rule. What is Flocculation value? 4
4. (a) Differentiate between Lyophilic and Lyophobic colloids. 2
   (b) Describe briefly the cleaning action of soap. 2

Section - B

5. (a) What are the factors on which the rate of a reaction deprends ? 2
   (b) A reaction of first order with respect to A has a rate constant of 0.062 min^{-1}. If we start with [A] = 0.5 mol/L, when would [A] reach the value of 0.05 mol\L ? 2
6. Define Energy of activation. From Arrhenius equation how can we derive an expression for the determination of activation energy? 4

7. (a) What are Pseudo first order reactions ? Give two examples. 2
(b) Discuss the points of difference between Molecularity and Order of a reaction. 2
8. Derive Michaelis-Menton equation for enzyme catalysed eaction. 4

Section - C

9. Attempt all the following :
(a) Name *four* colligative properties.
(b) What are Emulsions ? Give two examples.
(c) What are the units of rate constant of zero order and second order reaction ?
(d) Define Temperature coefficient. What is the value of temperature coefficient for most of the reactions ?
(e) Define Homogenous catalysis. Give example. (2×5=10)