

PHYSICAL CHEMISTRY - III

Paper-C

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

Time : Three Hours]

[Maximum Marks : 26

Note : Attempt two questions each from Sections A and B, and the entire Section C.

SECTION-A

- I. (a) State and explain Raoult's law for solution containing non-volatile solute. 2
(b) Calculate the osmotic pressure of 100 mL of solution containing 35 g of urea at 20°C. 2
Given $R = 0.0821 \text{ atm LK}^{-1} \text{ mol}^{-1}$.
- II. What do you mean by Osmotic pressure ? Derive thermo-dynamically the expression for osmotic pressure of dilute solutions. 4
- III. What are Emulsions ? What are their different types ? Give example of each type 4
- IV. (a) Explain Brownian movement. What is the significance of Brownian movement ? 2
(b) Describe briefly the Cleansing action of soap. 2

SECTION - B

- V. (a) Differentiate between Rate law and Law of mass action. 2
(b) A first order reaction is 12.75% complete in 32 minutes. Calculate the value of the rate constant. Also find the half life time period for the reaction. 2
- VI. Define Half life of a reaction. Derive an expression for the half life period of the first order reaction. 4
- VII. (a) Why does the rate of reaction become double for every ten degree rise in temperature ? 2
(b) Discuss the Collision theory of reaction rates. 2
- VIII. Derive Michaelis-Menton equation for enzyme catalysed reaction. 4

SECTION - C

- IX. (a) Define Ideal and Non-ideal solutions. 2
(b) What is Gel ? Give two examples. 2
(c) What are the units of rate constant of zero order and third order reaction ? 2
(d) Define Activation energy. What is the relation between Activation energy and Rate constant 4

- (e) of a reaction ?
A catalyst is more effective when finely divided. Comment.

(2×5=10)