

7. Discuss Michaelis-Menten concept of Enzyme catalyzed reaction. Evaluate Michaelis constant by Lineweaver - Burk and Eadie Hofstee methods. **16**

Unit IV

8. (a) Discuss the movement of ions under the influence of electric field. Explain mobility of ions and give its relation with current density. **5**
(b) Derive Einstein Relation between absolute mobility and diffusion coefficient. **6**
(c) Derive the Nernst-Einstein equation and discuss its limitations. **5**
9. (a) Discuss the concept of rate process approach to ionic migration and derive the relation for equivalent conductivity. **8**
(b) Derive Planck-Henderson equation for the diffusion potential. **8**



31117

M.Sc. EXAMINATION, 2025

(Second Semester)

(Re-appear Only)

CHEMISTRY

Physical Chemistry - II

(2020-21 Onwards)

Time : 3 Hours]

[Maximum Marks : 80

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks.

1. (a) What is Born Oppenheimer equation in quantum mechanics ?
- (b) What is probability distribution function ?
- (c) "Absolute zero cannot be attained" Explain this statement.
- (d) What is residual entropy ? Explain
- (e) What is an explosion reaction ? Give example.
- (f) Explain the factors affecting ionic mobility.
- (g) Explain the term activation energy.
- (h) What is competitive and non-competitive inhibition ? **8×2=16**

Unit I

2. (a) Solve the Schrödinger wave equation for the energy of a particle in three Dimensional box. **8**
- (b) Solve radial equation for Hydrogen atom. **8**
3. Set up Schrödinger wave equation for hydrogen atom. Evaluate energy of Rigid rotator. **16**

Unit II

4. (a) Write the Clasius-Clapeyron equation in the integrated form. What are its important applications **8**
- (b) Explain third law of thermodynamics. Determine absolute entropy of crystalline solids. **8**
5. (a) What are eutectic systems ? Discuss phase diagram of Lead silver system. **8**
- (b) Explain the following terms with example : **8**
 - (i) Invariant system
 - (ii) Transition point
 - (iii) Cryohydric point
 - (iv) Meta stable equilibrium.

Unit III

6. (a) What are chain reactions ? Discuss Hydrogen Bromine chain reactions and derive rate equations. **8**
- (b) Discuss the Rice-Herzfeld mechanism for the decomposition of acetaldehyde. **8**