

Roll No.

22002

**M. Sc. Chemistry 2nd Semester
Examination – May, 2019**

PHYSICAL CHEMISTRY-II

Paper : CY(H)-202

Time : Three hours]

[Maximum Marks : 80

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

Note : Attempt any *five* questions, selecting at least *one* from each Unit. Question No. 1 is *compulsory*. All questions carry equal marks.

1. (a) What is probability distribution function?
- (b) What are spherical harmonics?
- (c) What is competitive and non-competitive inhibition?
- (d) What is Walden rule?

P. T. O.

- (c) What are the characteristics of chain length?
- (f) What is meant by steady state approximation?
- (g) What is an explosion reaction? Give example.
- (h) Explain the factors effecting ionic mobility.

$$2 \times 8 = 16$$

UNIT – I

- 2. (a) Solve the Schrodinger wave equation for the energy of a particle in three. 12
- (b) Dimensional box. 4
- 3. Discuss the shape of p-orbital using the concept of quantum mechanics. Set up the Schrodinger wave equation for a Rigid Rotator and obtain equations for the energy eigen values and normalized eigen function. 16

UNIT – II

- 4. (a) Discuss the Third law of thermodynamics and its limitations. 8

- (b) Discuss Clausius-Clayperon's equation application.
5. (a) Discuss phase diagram of two completely components system.
- (b) Discuss Phase Diagram of Eutectic system congruent and incongruent melting point.

UNIT – III

6. (a) Discuss the general treatment of chain reaction and explain the concepts of apparent activation energy and chain length.
- (b) What are explosion reactions? Discuss by taking H_2-O_2 example.
7. Derive Michaelis-Menton equation of Enzyme catalyzed equation. Evaluate Michaelis constant by Lineweaver - Burk and Eadie Hofstae methods.

UNIT – IV

- (a) Explain the rate process approach to ionic migration and derive an equation for the equivalent conductivity on the basis of it. 8
 - (b) Derive the Nernst Plank's Flux equation and Discuss its consequences. 8
 - (a) Give an account of Debye-Huckel-Onsager theory of conductance of strong electrolytes. 8
 - (b) Write a note on the Onsager Phenomenological equations. 8
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