Roll No. : .....

Total No. of Questions : **11**] [Total No. of Printed Pages : **3**

BPP–1080

M.Sc. (Previous) Examination, 2022

CHEMISTRY

Paper - III

CH–403

(Physical Chemistry)

*Time : **3** Hours*] [*Maximum Marks : **75***

Section–A **(Marks : 2 × 10 = 20)**

Note :– Answer all *ten* questions (Answer limit **50** words). Each question carries **2** marks.

Section–B **(Marks : 5 × 5 = 25)**

Note :– Answer all *five* questions. Each question has internal choice (Answer limit **200** words). Each question carries **5** marks.

Section–C **(Marks : 10 × 3 = 30)**

Note :– Answer any *three* questions out of five (Answer limit **500** words). Each question carries **10** marks.

Section–A

1. (i) Explain the well-defined functions.

   (ii) State linear variation principle.

(iii) What do you understand by Ordinary Momentum and Generalised Angular Momentum ?

(iv) Explain the Zeeman Splitting.

(v) Define the Portal Molar Properties. How is it determined ?

(vi) Write a short note on excess functions for non-ideal solutions.

(vii) What do you mean by Partition Function ? Define Molar Partition Function.

(viii) Define Surface active Agents with suitable examples.

(ix) What are Liquid Crystal Polymers ? Give an example and application.

(x) What do you understand by Quantisation of charge transfer ?

Section–B

2. Set up and solve the Schrödinger wave equation for Partrek in a one-dimensional box.

Or

Explain Russell-Saunders terms and coupling schemes.

3. State the second law of Thermodynamics. Discuss what was the necessity of introducing second law of thermodynamics.

Or

Define Activity and Activity coefficient. How will you determine activity coefficient ? Mention at least one method.

4. Discuss the kinetic and thermodynamic control of reaction with suitable examples.

Or

Explain oscillatory reactions with suitable examples.

5. Derive Gibbs adsorption isotherm for adsorption from for solutions.

Or

Write a short note on Micro-emulsion and reverse micelles.

6. Write a note on ion solvent interactions.

Or

What is Electrocatalysis ? Discuss its mechanism.

Section–C

7. Explain the thickel theory of conjugated system and apply it to Ethylene.

8. Explain Debye thickel theory for activity coefficient of electrolytic solutions. How will you determine activity and ionic strength ?

9. Discuss the Kinetic Salt Effects.

10. What are the Macromolecules ? How is the molecular weight of a macromolecule determined with the help of osmotic pressure and viscosity measurements ?

11. What is the principle of Polarography ? Derive Ilkovic equation. Explain the halfwave potential and its significance.