Roll No. : .....

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

BPMS–511

M.Sc. (Previous) Examination, 2023

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) Write Schrodinger wave equation.

   (ii) Describe Pauli exclusion principle.

(iii) Write a short note on Practical Molar Free Energy.

(iv) Explain concept of Fugacity.

(v) Discuss on activated complex theory.

(vi) Write short note on Flash Photolysis.

(vii) Write Kelvin equation.

(viii) What do you mean by Surface Active Agents ?

(ix) Write Lippmann equation.

(x) Write a short note on Corrosion.

Section–B

2. Write a note on Perturbation theory.

Or

Write a short note on the Harmonic Oscillator.

3. Write a brief note on free energy potential and entropies. 2½+2½=5

Or

Discuss on coupled reaction and electric conduction. 2½+2½=5

4. Explain Kinetic salt effect and steady state kinetics. 2½+2½=5

Or

Explain Collision theory of reactions rate. 5

5. Write a note on molecular mass determination.

Or

What do you mean by Polymer ? Explain kinetics of polymerisation.

6. Write a note on Debye-Huckel-Jerum mode.

Or

Discuss on Butler-Volmer equation.

Section–C

7. Write a note on Slater-Condon parameters and explain team separation energy of the Pn configuration. 6+4=10

8. Explain the following :

   (i) Phenomenological equation

   (ii) Microscopic Reversibility and Onsager's reciprocity relation 3+3+4=10

9. Write a short note on Linde-mann-Hinshelwood theory of Unimolecular reaction.

10. Write notes on the following :

    (i) BET Equation

    (ii) Critical Micellar Concentration (CMC) 5+5=10

11. Explain the following :

    (i) Hodge-Huxley equation

    (ii) Nernst-Planck equation

    (iii) Core conductor models 5+2+3=10