

M.Sc.(Chem.) Semester - 2 (CBCS) Examination
March/April – 2025 (As Per Syllabus Year-2023)
Physical Chemistry (Core)

Time: 2:30 Hours

Marks: 70

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

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- Que-1(A) Answer the following. (04)**
- 1) Explain Cyclization reaction.
 - 2) Explain Addition and substitution reactions
- Que-1(B) Answer any two questions out of three. (10)**
- 1) Explain the statistics of linear polycondensation.
 - 2) Explain Cross linking reaction
 - 3) Write a note on
 1. Stereo regular polymers
 2. Molecular weight control in polycondensation
- Que-2(A) Answer the following. (04)**
- 1) A polymer contains equal number of molecules having molecular weight 1×10^5 , 1.5×10^5 , and 2.5×10^5 . Calculate number average and Weight average molecular weight of the polymer.
 - 2) Discuss the number average molecular weight
- Que-2(B) Answer any two questions out of three. (10)**
- 1) Explain chain transfer reaction and derive the Flory – Mayo relation for it.
 - 2) Kinetics of anionic and cationic polymerization.
 - 3) Explain Copolymerization and its kinetics
- Que-3(A) Answer the following (04)**
- 1) Define the term: Conductors, Semiconductors and Insulators.
 - 2) Explain the quasicrystals.
- Que-3(B) Answer any two questions out of three. (10)**
- 1) Write a note on:
 - (i) Miller indices
 - (ii) Band theory
 - 2) Discuss the followings:
 - (i) Network Covalent crystals
 - (ii) Ionic crystals and
 - (iii) Molecular crystals
 - 3) What are Point Defects? Explain the Schottky, Line and Metal excess point defect in crystals
- Que-4(A) Answer the following. (04)**
- 1) Define the term: CMC and Micellization
 - 2) Explain: Zeta potential
- Que-4(B) Answer any two questions out of three. (10)**
- 1) Write a note on Surfactant
 - 2) Explain the Gibb's adsorption isotherm.
 - 3) Give a brief explanation about lyophobic and lyophilic sols.
- Que-5(A) Answer the following. (04)**
- 1) Describe the kinetics of decomposition of Hydrogen-Iodide.
- Que-5(B) Answer any two questions out of three. (10)**
- 1) Discuss the activated complex theory in terms of thermodynamic.
 - 2) Describe the Salt effect of fast reaction.
 - 3) Explain the influence of solvent on reaction rates.
