

M.Sc.(Chem.) Semester - 2 (CBCS) Examination
March/April – 2026 (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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- Q.1(A) Answer the following. (04)**
(1) Explain: Reaction route of poly functional compounds.
(2) Define: Vulcanization rubbers and Isotactic polymers
- Q.1(B) Answer any two questions out of three. (10)**
(1) Describe the Statistics of linear polycondensation.
(2) Explain the followings
i. Miscellaneous reactions
ii. Molecular weight control in polycondensation
(3) Explain the cyclization reaction and cross linking reaction.
- Q.2(A) Answer the following. (04)**
(1) Define : Telomerisation and Weight everage molecular weight.
(2) A polymer contains equal number of molecules having molecular weight 2.0×10^5 , 3.5×10^5 , and 4.5×10^5 . Calculate number average and weight average molecular weight of the polymer
- Q.2(B) Answer any two questions out of three. (10)**
(1) Explain the kinetics of ionic polymerization.
(2) Explain the kinetics of chain transfer reactions of free radical polymerization.
(3) Discribe the Co-Ordination polymerization.
- Q.3(A) Answer the following. (04)**
(1) Define the term: conductors, semiconductors and insulators.
(2) What are Point Defects?
- Q.3(B) Answer any two questions out of three. (10)**
(1) Give the detail explanation about types of crystals.
(2) Write a note on
i. Quasicrystals
ii. Line defects
(3) Explain the energy band theory of conductors.
- Q.4(A) Answer the following. (04)**
(1) Explain: General properties of colloids.
(2) Define the term: Micellization and Critical Miceller Concentration.
- Q.4(B) Answer any two questions out of three. (10)**
(1) Give a brief explanation about lyophobic and lyophilic sols.
(2) Explain the BET of multilayer adsorption isotherm.
(3) Explain the electrokinetic (Zeta) potential and its determination by electrophoresis.
- Q.5(A) Answer the following. (04)**
(1) Discuss the factors which influence the rate of reactions.
(2) Explain the Hinshelwood mechanism for Unimolecular reactions.
- Q.5(B) Answer any two questions out of three. (10)**
(1) Explain the influence of solvent properties on reaction rates.
(2) Explain the followings
i. Consecutive reaction.
ii. Kinetics of decomposition of Hydrogen-Iodide.
(3) Write a note on Transition State Theory in terms of thermodynamics.
