



QP CODE: 25803006



25803006

Reg No :

Name :

INTEGRATED MSC DEGREE EXAMINATION, JUNE 2025

Eight Semester

INTEGRATED MSC BASIC SCIENCE-CHEMISTRY

CORE - ICH8CR03 - ADVANCED PHYSICAL CHEMISTRY - II

2020 Admission Onwards

07C1B346

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. Give Arrhenius equation and explain its significance.
2. Compare Transition state theory with Collision theory.
3. Explain the use of ESR in the study of fast reactions.
4. Distinguish between specific and general acid-base catalysis.
5. What is an oscillating reaction?
6. Write a note on surface films.
7. Write short note on Donnan membrane equilibrium.
8. How do you determine the number average and mass average molar mass of a polymer?
9. Write Stern-Volmer equation and represent it graphically.
10. Why aromatic hydrocarbons usually exhibit P-type delayed fluorescence?

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. Derive the integrated rate equation for second order reaction when i) there are two reactants and both have the same initial concentration ii) the two reactants have different initial concentrations.
12. What is the significance of change in enthalpy and entropy, and volume of activation in reaction rates?
13. Illustrate Rice-Herzfeld mechanism with thermal decomposition of acetaldehyde.
14. Discuss the mechanism of H₂-O₂ reaction.





15. Illustrate the influence of ionic strength and the nature of the solvent on the rates of ionic reactions.
16. What is the effect of temperature and pressure on the adsorption of gases on solids?
17. Explain the basic principle and applications of TEM.
18. Derive a rate equation for the dimerisation of Anthracene.

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. Explain any four methods of determining the order of a reaction.
20. Discuss the mechanism and kinetics of enzyme-catalyzed reactions.
21. Discuss the principle of Surface Enhanced Raman Scattering.
22. (a) Compare Langmuir Hinshelwood and Riedel Model of surface catalysed reaction. b) Discuss Eley – Rideal mechanism.

(2×5=10 weightage)

