QP CODE: 25022488

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Reg No : .....

Name : .....

M.Sc DEGREE (CSS) SPECIAL REAPPEARANCE EXAMINATION, APRIL 2025

Third Semester

M.Sc PHARMACEUTICAL CHEMISTRY

CORE - CH040302 - PHYSICAL CHEMISTRY

2019 ADMISSION ONWARDS

4ED2631C

Time: 3 Hours Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. Explain the postulates of conventional transition state theory.
2. Explain the use of NMR in the study of kinetics of fast reactions.
3. Distinguish between rainbow scattering and glory scattering of molecular beams.
4. Give Gibbs adsorption equation. Explain the terms used in the equation.
5. Write a note on chemical enhancement mechanism of SERS.
6. What are phenomenoloical equations?
7. Define concentration quenching.
8. Explain greenhouse effect.
9. Coulometry can be used for precipitation titration method of quantitative analysis. Ilustrate with example.
10. Give the classification of atomic spectroscopic methods.

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. What is meant by kinetic isotope effect? Illustrate the origin of primary kinetic isotope effect.
12. Discuss in detail the protolytic and prototropic mechanism of acid catalysis.
13. Differentiate between SEM and TEM.
14. Briefly explain the different electro-kinetic phenomena associated with colloidal solutions.

15. A certain system absorbs $3x10^{18}$ quanta of light/sec. On irradiation for 20 minutes 0.003 mole of the reactant was found to have reacted. Calculate the quantum efficiency for the process

16. What is Photovoltaic Effect? Explain the merits and demerits of solar cells.

17. Compare electron and neutron diffraction methods.

18. Write a note on the principle and few applications of Flame Emission Spectroscopy.

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. What are chain reactions? Discuss the concept of steady state approximation for the study of kinetics of chain reactions and arrive at the rate law for Hydrogen- Chlorine reaction.

20. Explain the different mechanisms of surface catalysed reactions.

21. a) What are Coupled reactions? Discuss about the role of ATP in bioenergetics.
    b) Discuss about the thermodynamic aspects of glycolysis and biological redox reactions

22. Discuss in detail the principle and applications of amperometric titrations in the qualitative analysis of cations and anions in solutions. What are its merits and demerits?

(2×5=10 weightage)