



QP CODE: 26019607



Reg No :

Name :

M.Sc DEGREE (CSS) EXAMINATION, MARCH 2026

Fourth Semester

M Sc Industrial Chemistry

ELECTIVE - CH900402 - ADVANCED PHYSICAL CHEMISTRY

2020 Admission Onwards

42C4EBA4

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. Give the linear phenomenological relation and explain the terms.
2. What is meant by thermoosmosis?
3. What is meant by E-type delayed fluorescence?
4. Explain briefly the free electron theory of solids.
5. What do you understand by an extrinsic semiconductor? Give examples.
6. What is meant by a lyophobic colloid? Give an example.
7. What are fuel cells? Give examples.
8. What are conducting polymers?
9. Explain flash photolysis method for studying fast reactions.
10. What is meant by the term collision cross section?

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. Verify the Onsagar reciprocal relation for a simple reversible reaction.
12. Explain the Stern Volmer equation.
13. Explain the zone theory and MO theory of solids.





14. Distinguish between physisorption and chemisorption with suitable examples.
15. What are fuel cells? Explain the various types of fuel cells. Mention important application of fuel cells.
16. Explain the cell reactions of PEM fuel cell, alkaline fuel cell and phosphoric acid fuel cell.
17. Distinguish between NMR and ESR methods for studying fast reactions.
18. Derive RMS velocity from Maxwell Boltzmann law of distribution of molecular velocities.

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. Explain the various photophysical processes using a Jablonski diagram?
20. Explain the various optical properties and its applications.
21. Discuss the BET equation and its utility in the determination of surface area of an adsorbent.
22. Derive the vanderWaal's reduced equation of state. State the law of corresponding states and explain its significance.

(2×5=10 weightage)

