

G 18000974



18000974

Reg. No.....

Name.....

M.Sc. DEGREE (C.S.S.) EXAMINATION, MAY 2018

Fourth Semester

Faculty of Science

Branch III : Chemistry—Pure Chemistry

CH4E03—ADVANCED PHYSICAL CHEMISTRY

(2012 Admission onwards)

Time : Three Hours

Maximum Weight : 30

Section A

*Answer any **ten** questions.*

Each question carries a weight of 1.

1. What is “structure factor”? Explain its significance.
2. Define reciprocal lattice. What is its significance?
3. Give one example each : a) An electrochemical cell without liquid junction b) A concentration cell without liquid junction.
4. Explain concentration polarization.
5. Show that the mean free path increases with decrease in pressure
6. What is a fluorephores ?
7. What is mean ionic activity ? Write an equation for mean ionic activity.
8. Give Lippmann equation. Explain its terms.
9. What is sensitized fluorescence ?
10. Write Ilkovic equation. Explain the terms.
11. What are Miller Indices ? How they are determined.
12. What is principle of amperometry ?
13. Why atomic emission methods with an indirectly coupled plasma source are is better suited for multi element analysis than are flame atomic absorption methods ?

(10 × 1 = 10)

Turn over





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Section B

*Answer any **five** questions .
Each question carries a weight of 2.*

14. Why is source modulation employed in AAS ?
15. Describe the three modes of introducing the sample into an ICP torch.
16. Derive Debye-Huckel-Onsager equation.
17. Explain the working of a Silver coulometer.
18. Explain how activity coefficients calculated from equilibrium measurements.
19. Explain the working of a Hollow cathode lamp.
20. Derive Maxwell's law of distribution of velocities.
21. Explain Drude-Nernst electrostriction model.

(5 × 2 = 10)

Section C

*Answer any **two** questions .
Each question carries a weight of 5.*

22. (a) Explain Debye-Falkenhagen effect.
(b) Briefly explain the theories of ions in solution.
23. Write a brief account of polarographic analysis.
24. Derive Butler-Volmer equation.
25. Explain the rotating crystal method for the X-Ray diffraction studies of crystals.

(2 × 5 = 10)

