

20P214

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Name.....

Reg. No.....

SECOND SEMESTER M.Sc. DEGREE EXAMINATION, APRIL 2021

(CUCSS - PG)

(Regular/Supplementary/Improvement)

**CC19P CHE2 C08 - ELECTROCHEMISTRY, SOLID STATE CHEMISTRY AND
STATISTICAL THERMODYNAMICS**

(Chemistry)

(2019 Admission onwards)

Time: Three Hours

Maximum: 30 Weightage

SECTION-A

Answer *all* questions. Each question carries 1 weightage.

1. What is meant by thermodynamic probability?
2. Explain the term Birefringence.
3. What is Meissner effect?
4. Write Boltzmann Plank relation and explain the terms?
5. What are fuel cells?
6. Define over voltage.
7. What is law of equipartition of energy?
8. Write Nernst equation for standard hydrogen electrode.
9. What is meant by Bravice Lattice?
10. Define Hall Effect.

(8 × 1 = 8 Weightage)

Section B

Answer any *six* questions. Each question carries 2 weightage.

11. Prove, why five fold rotation axis doesn't exist in crystals.
12. Explain Ilkovic equation on polarography method
13. What are secondary cells, explain with example.
14. Explain Tafel equation and its significance
15. Briefly explain band theory of solids.
16. Discuss Cooper theory of superconductivity.
17. Explain the electrode reaction in polymer electrolyte fuel cells.
18. Explain various types of magnetic properties
19. Give a brief account on polarization and its types.
20. Discuss screw axis and glide plane with examples
21. Briefly explain the relation between molecular and molar partition functions

(6 × 2 = 12 Weightage)

Section C

Answer any *two* questions. Each question carries 5 weightage.

22. Based on Boltzmann distribution concept, arrive at partition function. What are the rotational, translational and vibrational contributions to total partition function?
23. Illustrate on Einstein's theory of heat capacities of solids and on Debye's modification.
24. Explain different theories on hydrogen over voltage
25. Illustrate on different types of imperfection in solids.

(2 × 5 = 10 Weightage)
