

C 83029

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Name.....

Reg. No.....

**SECOND SEMESTER M.A./M.Sc./M.Com. DEGREE EXAMINATION  
JUNE 2020**

(CBCSS)

Chemistry

**CHE 2C 08—ELECTRO CHEMISTRY, SOLID STATE CHEMISTRY AND STATISTICAL  
THERMODYNAMICS**

(2019 Admissions)

Time : Three Hours

Maximum : 30 Weightage

**Section A**

*Answer eight questions.  
Each question carries a weight of 1.*

1. Define mean ionic activity co-efficient.
2. Write electrode reactions for Ni-Cd cell.
3. What is activation over potential ?
4. In polarography excess KCl is added. Why ?
5. Explain the terms :
  - (a) Screw axis.
  - (b) Glide plane.
6. Explain the origin of color centers in solids.
7. Find residual entropy of CO if 50% of CO units are in CO orientation and 50% are in OC orientation.
8. The ortho-para ratio of molecular hydrogen is 3:1. Justify the observation.
9. State and explain Dulong Petit's law.
10. What do you mean by dilute system condition ?

(8 × 1 = 8 weightage)

**Section B**

*Answer six questions.  
Each question carries a weight of 2.*

11. State Debye Hückel limiting law. How is it verified ?
12. Discuss the working of a lead-acid battery.

**Turn over**

13. What are the models of electrical double layer at solid-liquid interface ? Discuss.
14. Briefly discuss Cooper theory of superconductivity.
15. How would you evaluate equilibrium constant from molecular parameters ? Discuss.
16. Derive an equation for vibrational contribution towards heat capacity of gases.
17. Derive Fermi Dirac distribution law.
18. Discuss Bose Einstein condensation.

(6 × 2 = 12 weightage)

### Section C

*Answer two questions.*

*Each question carries a weight of 5.*

19. (a) Derive Brönsted Bjerrum relationship.  
(b) Discuss the working of H<sub>2</sub>-O<sub>2</sub> fuel cell.
20. Discuss theory and applications of polarography.
21. Write a brief account of imperfections in solids.
22. Define partition function. How is it related to ?
  - (a) Entropy.
  - (b) Gibbs free energy.
  - (c) Equilibrium constant of a reaction.

(2 × 5 = 10 weightage)