Reg. No. : ....

Name : ....

First Semester M.Sc. Degree (CBSS – Supple. (One Time Mercy Chance)/Imp.) Examination, October 2023
(2014 to 2022 Admissions)
CHEMISTRY
CHE1C.04 : Physical Chemistry – I

Time : 3 Hours　　　　　　　　　　　　　　　　　Max. Marks : 60

SECTION – A

Answer **all** questions in **one** word or **one** sentence. **Each** question carries **1** mark.

1. State third law of thermodynamics.

2. Define residual entropy.

3. Explain the term ionic mobility.

4. Write Walden equation and explain the terms.

5. Define overvoltage.

6. What is meant by transfer coefficient ?

7. Define cathode.

8. How Gibbs free energy varies during corrosion ?

SECTION – B

Answer **any eight** questions. **Each** question carries **2** marks.

9. What is absolute entropy ? How is it determined ?

10. State and explain Nernst heat theorem.

P.T.O.

11. What is Onsager reciprocal relationship ?

12. Explain the role of temperature on ionic conductance.

13. What is Debye Falken (Debye-Falkenhagen) effect ?

14. Why does the H^+ ion show abnormal conductance ?

15. What are concentration cells ?

16. What are the advantages of dropping mercury electrode ?

17. Write Tafel equation. Why it is important ?

18. Discuss the environmental aspects of corrosion.

19. What is Pitting Bedworth ratio ?

20. Write a short note on corrosion in Indian scenario.

SECTION – C

Answer **any four** questions. **Each** question carries **3** marks.

21. Write a short note on entropy production.

22. What are Maxwell relations ? Explain its significance.

23. How solubility is related to activity coefficient ? Explain.

24. What is osmotic coefficient ? What are its significances ?

25. Write a short note on electrode kinetics.

26. What is Lippmann potential ? Why it is important in electrochemistry ?

27. Discuss the limitations of Pourbaix diagrams.

28. What is EMF ? How EMF of a cell is measured ?

SECTION – D

Answer **four** questions. **Each** question carries **6** marks.

29. A) How non-reversible thermodynamics is used to explain thermo-osmosis ? Explain.

　　OR

　B) Derive thermodynamic expressions for ΔG and ΔS of a gas mixture.

30. A) Derive Debye-Huckel-Onsager equation.

　　OR

　B) Explain Debye-Huckel limiting law. What are its applications ?

31. A) Explain the theories of overvoltage.

　　OR

　B) Explain the principle and working of polarography. What are its advantages ?

32. A) Discuss the different types of corrosion damage.

　　OR

　B) Explain briefly on the thermodynamics of corrosion.

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