

22U614

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Name :

Reg No. :

SIXTH SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2025

(CBCSS-UG)

(Regular/Supplementary/Improvement)

CC19U CHE6 B11 - PHYSICAL CHEMISTRY - III

(Chemistry - Core Course)

(2019 Admission onwards)

Time: 2 Hours

Maximum: 60 Marks

Credit: 3

Part A (Short answer questions)

Answer *all* questions. Each question carries 2 marks.

1. What is the limitation of the Debye-Huckel-Onsager equation?
2. Give the relation between transport number and respective speeds of the cation and anion
3. The limiting molar conductivities of sodium acetate, HCl and NaCl are 91.0, 426.16 and 126.45 ohm⁻¹ cm² mol⁻¹ respectively at 298 K. Calculate the limiting molar conductivity of acetic acid.
4. Explain precipitation titration with an example and draw its conductometric titration curve.
5. What is meant by a silver-silver chloride electrode? Give the electrode reaction.
6. Write the expression connecting the EMF of a galvanic cell to the equilibrium constant of the cell reaction and explain the terms.
7. What is a non-ideal solution?
8. What is meant by "relative lowering of vapour pressure"?
9. Explain why a solution of sodium carbonate in water is basic.
10. Explain structure of CsCl,
11. Give the coordination number of each sphere in (a) a hcp structure and (b) a ccp structure.
12. What are liquid crystals?

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

Answer *all* questions. Each question carries 5 marks.

13. State and explain Faraday's first law of electrolysis
14. State and explain Kohlrausch's law and explain one of its applications.
15. What are fuel cells? Discuss the H₂-O₂ fuel cell?

16. Explain the term viscosity with regard to liquids and also explain the dependence of viscosity on the strength of intermolecular forces in liquids.
17. Explain the buffer action of a mixture of acetic acid and sodium acetate.
18. Explain how identification of the type of cubic lattice is possible from interplanar distance ratio.
19. Explain extrinsic semiconductivity based on band theory.

(Ceiling: 30 Marks)

Part C (Essay questions)

Answer any **one** question. The question carries 10 marks.

20. a) What is E.M.F of a cell? Describe the potentiometric method of determining the EMF of a cell.
21. (a) Distinguish between the terms isotropy and anisotropy.
(b) Discuss the terms: (i) space lattice; (ii) unit cell; (iii) Miller indices.

(1 × 10 = 10 Marks)
