

23U614

(Pages: 2)

Name:

Reg.No:

SIXTH SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2026

(CBCSS - UG)

(Regular/Supplementary/Improvement)

CC19UCHE6B11 - PHYSICAL CHEMISTRY - III

(Chemistry - Core Course)

(2021 Admissions)

Time : 2.00 Hours

Maximum : 60 Marks

Credit : 3

Part A (Short answer questions)

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

1. Give two limitations of Arrhenius theory of electrolytic dissociation.
2. Find equation for the limiting molar conductance of acetic acid using Kohlrausch's law.
3. Sketch the general shapes of the conductometric titration curves for the following:(a) strong acid vs strong base;. (b) weak acid vs weak base
4. Explain reference electrode. Give one example.
5. State and explain Henry's law.
6. What is meant by "relative lowering of vapour pressure"?
7. What are isotonic solutions?
8. Give examples for acidic and basic buffers.
9. What is meant by solubility product? Give the expression for solubility product of calcium phosphate.
10. Define the terms *lattice*, *basis*, and *crystal structure*. How are these three concepts related to each other in crystallography?
11. Differentiate between primitive and centred unit cells.
12. What is meant by doping in a semiconductor?

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

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

13. What is meant by cell constant? How is it determined?
14. Explain Wien effect.
15. What is liquid junction potential? How can it be eliminated?

16. What are fuel cells? Give one example. Represent the reactions taking place at anode and cathode of the above cell. Mention three advantages of fuel cells over other conventional energy producing devices
17. The first order diffractions from the (100), (110) and (111) planes of cubic NaCl for X-rays (K) from a palladium anticathode are observed at glancing angles of 5.9° , 8.4° and 5.2° respectively. What do these observations suggest regarding the type of lattice that NaCl has?
18. Derive an expression relating the density of a known crystal and its unit cell edge length.
19. Explain the structural features of smectic and nematic liquid crystals.

(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) Explain the ostwald's viscometer method of determination of the viscosity of a liquid, using poiseuille's equation.
b) Explain optical exaltation.

(1 × 10 = 10 Marks)
