

25U216

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Name :

Reg. No :

SECOND SEMESTER UG DEGREE EXAMINATION, APRIL 2026

(FYUGP)

(Regular/Supplementary/Improvement)

CC24UCHE2MN102 - LIQUID STATE, GASEOUS STATE AND ELECTROCHEMISTRY

(Chemistry - Minor Course)

(2024 Admission onwards)

Time: 2.0 Hours

Maximum: 70 Marks

Credit: 4

Part A (Short answer questions)

Answer *all* questions. Each question carries 3 marks.

1. Distinguish the cholesteric and smectic liquid crystals based on their structural features. [Level:4] [CO1]
2. Compare the intermolecular forces in liquids with those in gases. [Level:4] [CO1]
3. Construct the vapour pressure-composition curve for a binary solution of components A and B showing positive deviation from Raoult's law. [Level:4] [CO1]
4. Analyze the pressure effect the solubility of a gas in a given liquid? [Level:4] [CO1]
5. Distinguish between coefficient of viscosity and mean free path of a gas. [Level:4] [CO2]
6. What is meant by viscosity of gases? [Level:1] [CO2]
7. Distinguish between free path and mean free path. [Level:4] [CO2]
8. Explain critical compressibility factor. [Level:2] [CO3]
9. Describe critical temperature of a gas. [Level:2] [CO3]
10. Explain resistivity (specific resistance). Mention its SI units. [Level:2] [CO4]

(Ceiling: 24 Marks)

Part B (Paragraph questions/Problem)

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

11. Detect the osmotic pressure of a 3% aqueous solution of sucrose (molar mass = 342 g mol⁻¹) at 300 K. [R = 0.0821 Latm K⁻¹ Mol⁻¹]. [Level:4] [CO1]

12. Give the Maxwell's equation for the distribution of molecular velocities. Sketch the distribution curve for two different temperatures and explain the influence of temperatures on distribution [Level:4] [CO2]
13. A 2.5 L flask contains 0.25 mol each of CO₂ and N₂ at 27°C. Calculate the partial pressures of the gases and total pressure. [Level:3] [CO2]
14. Describe virial equation of state and explain the terms. [Level:2] [CO3]
15. Explain compressibility factor with help of PV-P Plots of real gases. [Level:2] [CO3]
16. Describe how conductivity measurements may be used to determine the solubility of a sparingly soluble salt in water. [Level:2] [CO4]
17. (a) Discuss ostwald dilution law. (b) Define pH and pOH of a solution. [Level:2] [CO4]
18. Describe standard hydrogen electrode. [Level:2] [CO4]

(Ceiling: 36 Marks)

Part C (Essay questions)

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

19. Explain how the relative lowering of vapour pressure, elevation of boiling point, and depression of freezing point are used to determine the molecular weight of solutes. [Level:2] [CO1]
20. Explain the principle of conductometric titration and illustrate it with reference to any two types of acid-base titrations. [Level:2] [CO4]

(1 × 10 = 10 Marks)
