

SAMPLE PAPERS
DIPLOMA FIRST SEMESTER EXAMINATION 2025 (JUT)
ENGINEERING CHEMISTRY
DIPLOMA WALLAH

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Full Marks: 70 | **Time:** 3 Hours

Instructions:

1. Question No. 1 is **compulsory**.
 2. Answer any **FOUR** questions from the remaining (Q. 2 to Q. 7).
 3. All questions carry equal marks (14 marks each).
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Q.1 Multiple Choice Questions (Answer all 7) [2 x 7 = 14 Marks]

i. An atom is electrically neutral because it has equal numbers of:

- a) Protons and Neutrons b) Electrons and Neutrons c) Protons and Electrons d) Nuclei

ii. The shape of an 's' orbital is:

- a) Dumbbell b) Spherical c) Double-dumbbell d) Circular

iii. The unit of Electrochemical Equivalent (Z) is:

- a) Ampere/sec b) Gram/Coulomb c) Coulomb/Gram d) Volt/Ampere

iv. Duralumin is an alloy of:

- a) Cu and Zn b) Al, Cu, Mg, Mn c) Pb and Sn d) Ni and Cr

v. Which of the following is a natural polymer?

- a) Nylon b) Terylene c) Cellulose d) Teflon

vi. Acid Rain is mainly caused by the oxides of:

- a) Carbon b) Nitrogen and Sulfur c) Phosphorus d) Hydrogen

vii. The process of removing earthy impurities from ore is called:

- a) Refining b) Concentration c) Calcination d) Oxidation

Q.2

- A. Describe the Dual Nature of Matter (De Broglie's Equation) and Heisenberg's Uncertainty Principle.
- B. Explain the mechanism of Wet (Electrochemical) Corrosion. How does Tinning prevent corrosion?

Q.3

- A. State Faraday's Second Law of Electrolysis and explain its mathematical derivation.
- B. Explain the refining of metals using the Electrolytic Refining method with an example of Copper.

Q.4

- A. Write the preparation, properties, and engineering applications of Bakelite and Polyethylene.
- B. What is the Ozone Layer? Explain the chemical reactions involved in its depletion.

Q.5

- A. Explain the formation of Coordinate Covalent Bond with the example of NH_4^+ or H_3O^+ .
- B. Define and explain the significance of the Greenhouse Effect and Global Warming.

Q.6

- A. Discuss the properties and applications of Dielectric materials and Insulators (Glasswool/Asbestos).
- B. Explain the disposal of waste: Describe the methods of Landfilling and Incineration.

Q.7 Write Short Notes on any FOUR: [3.5 x 4 = 14 Marks]

- A. Characteristics of Electrovalent compounds.
- B. Differences between Calcination and Roasting.
- C. Composition and uses of Alnico.
- D. Classification of Polymers based on structure.
- E. Role of Catalytic Converters in reducing air pollution.
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MODEL SOLUTIONS (PAPER – 3)

MCQ Answer Key:

i. c) Protons and Electrons | ii. b) Spherical | iii. b) g/C | iv. b) Al, Cu, Mg, Mn | v. c) Cellulose
| vi. b) N and S | vii. b) Concentration

