

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. Which rule states that electrons enter the orbital of lowest energy first?
a) Hund's Rule b) Pauli's Principle c) Aufbau Principle d) Octet Rule
- ii. The maximum number of electrons in the 'M' shell is:
a) 2 b) 8 c) 18 d) 32
- iii. A substance that allows electricity to pass through it in molten or solution state is:
a) Insulator b) Dielectric c) Electrolyte d) Flux
- iv. Brass is an alloy of:
a) Cu and Sn b) Cu and Zn c) Al and Mg d) Fe and Cr
- v. The percentage of iron in an alloy is determined using:
a) HCl b) KMnO_4 c) NaOH d) AgNO_3
- vi. PVC stands for:
a) Plastic Vinyl Chloride b) Polyvinyl Carbonate c) Polyvinyl Chloride d) Poly Vinyl Cyanide
- vii. Which gas causes the depletion of the Ozone layer?

- a) SO₂ b) CO₂ c) CFCs d) CH₄

Q.2

A. State and explain Hund's Rule of Maximum Multiplicity and Pauli's Exclusion Principle with examples.

B. Define Alloy. What are the purposes of making alloys? Classify them with examples.

Q.3

A. Explain the mechanism of Electrolysis. Differentiate between Electrolytic and Galvanic cells.

B. Describe the extraction of metals through the process of Roasting and Smelting with chemical equations.

Q.4

A. What is Vulcanization of rubber? How does it improve the properties of natural rubber?

B. Explain Air Pollution. List the major air pollutants and their impact on human health.

Q.5

A. Define Hydrogen Bonding. Explain its types and how it affects the boiling point of water.

B. What are the mechanical properties of metals? Explain Hardness, Ductility, and Malleability.

Q.6

A. Discuss the compounding of plastics. Explain the role of Fillers and Plasticizers.

B. Explain the concept of BOD (Biochemical Oxygen Demand) and COD (Chemical Oxygen Demand).

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

A. Differences between Isotopes and Isobars.

B. Definition of Gangue, Flux, and Slag.

C. Applications of German Silver.

D. Environmental effects of IC Engine exhaust.

E. Objectives of Preventive Environmental Management (PEM).

MODEL SOLUTIONS (PAPER – 2)

MCQ Answer Key:

i. c) Aufbau Principle | ii. c) 18 | iii. c) Electrolyte | iv. b) Cu and Zn | v. b) KMnO_4 | vi. c) Polyvinyl Chloride | vii. c) CFCs

