

Code No: **R231204**

R23

SET - 1

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY GURAJADA VIZIANAGARAM

I B. Tech II Semester Supplementary Examinations January-2025

CHEMISTRY

(Common to CSE, IT, CSE(DS), CSE(AI), CSE(CS), CSE(AI&ML), AI&DS, AI&ML)

Time: 3 hours

Max. Marks: 70

*Question paper consists of Part A & Part B.
Part A is compulsory, Answer all questions.
In Part B, Answer any one question from each unit.*

PART-A

(20 Marks)

- 1 a) What are the bonding and antibonding molecular orbitals? [2]
- b) Define the bond order. What is the bond order of benzene? [2]
- c) Write a short note on the super capacitor. [2]
- d) List two applications of carbon nanotubes. [2]
- e) What is the primary battery? Give an example. [2]
- f) What is a fuel cell? Give any two examples. [2]
- g) How do biodegradable polymers degrade? [2]
- h) Write two applications of Bakelite. [2]
- i) What is the electromagnetic spectrum? [2]
- j) Write two deviations of lamberts-beers law. [2]

PART-B

(50 Marks)

Unit-1

- 2 a) Illustrate the molecular orbital diagram of a O₂ molecule and calculate its bond order and explain its magnetic property. [5]
- b) Derive Schrodinger wave equation? [5]

(OR)

- 3 a) Write a note on Fundamentals of Quantum mechanics. [5]
- b) Draw energy level diagrams of CO. And calculate its bond order. [5]

Unit-2

- 4 a) Write the properties of nano materials. [5]
b) Explain the basic principle and classifications of Super Conductors. [5]

(OR)

- 5 a) Write a note on applications of Graphines nanoparticles. [5]
b) Explain in detail about the basic concept and classification of semiconducting materials. [5]

Unit-3

- 6 a) Discuss about potentiometric sensors with examples. [5]
b) What is primary Battery? Write about construction, cell reactions and applications of Zinc-Air battery. [5]

(OR)

- 7 a) What is EMF? Calculate the emf of iron-copper voltaic cell [Fe/Fe²⁺//Cu²⁺/Cu] with standard potential of copper and iron as + 0.34 V and – 0.44 V respectively. [5]
b) Discuss the construction and working of the conductivity cell. [5]

Unit-4

- 8 a) Discuss preparation, properties and applications of Teflon. [5]
b) Distinguish between Thermoplastics and Thermosetting plastics. [5]

(OR)

- 9 a) Describe the preparation, properties and uses of Nylon-6, 6. [5]
b) Write about synthesis, properties and applications of Poly Lactic Acid. [5]

Unit-5

- 10 a) What is meant by Chromatography? Write about principle and instrumentation of HPLC chromatography with a neat diagram. [5]
b) Give an account on principle and instrumentation of IR spectroscopy. [5]

(OR)

- 11 a) Discuss the basic components of UV -Visible spectroscopy. [5]
b) Explain the different regions of the electromagnetic spectrum. [5]
