

Code: 23BS1202

**I B.Tech - II Semester – Regular / Supplementary Examinations
MAY 2025**

CHEMISTRY
(Common for IT, AIML, DS)

Duration: 3 hours

Max. Marks: 70

 Note: 1. This question paper contains two Parts A and B.

2. Part-A contains 10 short answer questions. Each Question carries 2 Marks.

3. Part-B contains 5 essay questions with an internal choice from each unit. Each Question carries 10 marks.

4. All parts of Question paper must be answered in one place.

BL – Blooms Level

CO – Course Outcome

PART – A

		BL	CO
1.a)	State the Heisenberg's uncertainty principle.	L1	CO2
1.b)	Explain O ₂ molecule is paramagnetic in nature based on MOT.	L2	CO2
1.c)	What is a superconductor? Give an example.	L1	CO2
1.d)	Define super capacitor. Give an example.	L1	CO2
1.e)	Differentiate between anode and cathode.	L2	CO2
1.f)	Define the principle of Potentiometric titration.	L1	CO2
1.g)	Express the functionality of monomer with an example.	L2	CO1
1.h)	Name the monomer of Nylon-6,6.	L1	CO1
1.i)	State the Beer-Lambert's law.	L1	CO1
1.j)	Write the principle of High-Performance Liquid Chromatography.	L1	CO3

PART – B

			BL	CO	Max. Marks
UNIT-I					
2	a)	Illustrate the molecular orbital diagram of O ₂ and calculate the bond order.	L3	CO2	5 M
	b)	Draw the π -molecular orbital diagram of 1, 3-butadiene.	L4	CO4	5 M
OR					
3	a)	Derive the Schrodinger wave equation. State the significance of ψ and ψ^2 .	L3	CO2	5 M
	b)	Draw the π -molecular orbital diagram of Benzene.	L4	CO4	5 M
UNIT-II					
4	a)	Construct the band diagrams of conductors, insulators and semiconductors.	L3	CO2	5 M
	b)	Classify super capacitors based on their characteristics and explain them in detail.	L4	CO4	5 M
OR					
5	a)	Explain the applications of semiconductors.	L4	CO4	5 M
	b)	What are the types of carbon nanotubes? Give their applications.	L3	CO2	5 M

UNIT-III					
6	a)	Describe the construction and working of Lithium-ion battery.	L3	CO2	5 M
	b)	Discuss the conductometric titration of strong acid and strong base.	L4	CO4	5 M
OR					
7	a)	Explain construction and working of H ₂ -O ₂ fuel cell.	L4	CO4	5 M
	b)	Derive the Nernst equation of a single electrode potential.	L3	CO2	5 M
UNIT-IV					
8	a)	Differentiate between thermoplastics and thermosetting plastics.	L4	CO5	5 M
	b)	Interpret the synthesis and applications of buna-N rubber.	L3	CO3	5 M
OR					
9	a)	What are biodegradable polymers? Write the synthesis and applications of PGA.	L3	CO3	5 M
	b)	Explain the preparation and applications of Bakelite.	L4	CO5	5 M
UNIT-V					
10	a)	Explain the classification of chromatography.	L3	CO3	5 M
	b)	Make use of neat diagrams to explain modes of vibrations.	L4	CO5	5 M
OR					

11	a)	Describe the instrumentation of UV-Visible spectroscopy.	L3	CO3	5 M
	b)	Explain the electronic transitions in UV-Visible spectroscopy.	L4	CO5	5 M