

**PRAGATI ENGINEERING COLLEGE: SURAMPALEM
(AUTONOMOUS)**

I B.Tech I Semester Supplementary Examinations, July– 2024

CHEMISTRY

(Common to EEE, ECE, CSE (CS) and IT)

Time: 3 hours

Max. Marks: 70

- i. Question 1 shall contain 10 compulsory short answer questions (2 questions from each unit) for a total of 20 marks such that each question carries 2 marks.
- ii. In each of the questions from 2 to the last question, there shall be either/or type questions of 10 marks each. Student shall answer any one of them.

Q. No.	Questions	BTL	CO	Marks
1.	a) State the de Broglie hypothesis.	K1	CO1	2M
	b) Explain the physical significance of Ψ and Ψ^2 .	K1	CO1	2M
	c) List out any four applications of semiconductors.	K2	CO2	2M
	d) Distinguish between type-I and type-II superconductors.	K2	CO2	2M
	e) What are anode, cathode, and electrolyte of Zinc-air battery?	K3	CO3	2M
	f) Draw the graph for conductivity titrations of strong acid vs. strong base.	K2	CO3	2M
	g) Define the functionality of monomer.	K1	CO4	2M
	h) List out any two applications of Biodegradable polymers.	K2	CO4	2M
	i) What is electromagnetic spectrum?	K1	CO5	2M
	j) Define Green chemistry.	K1	CO5	2M
UNIT-I				
2.	a) Derive the one dimensional Schrodinger equation for a free particle.	K4	CO1	5M
	b) Analyze the bonding nature of O_2 molecule and predict the magnetic nature.	K3	CO1	5M
OR				
3.	a) Discuss the postulates of Molecular orbital theory	K2	CO1	5M
	b) Draw the π -molecular orbitals of benzene and discuss the presence of nodes.	K3	CO1	5M
UNIT-II				
4.	a) Explain the preparation of carbon nanotube by Arc-Discharge process.	K2	CO2	5M
	b) Differentiate single-walled carbon nanotubes and multi-walled carbon nanotubes and discuss their applications.	K3	CO2	5M
OR				
5.	a) Illustrate the working principle of electrostatic double layer supercapacitor.	K2	CO2	5M
	b) What are fullerenes? Discuss their applications in various fields.	K2	CO2	5M

UNIT-III					
6.	a)	What is the Nernst equation and give its significance.	K1	CO3	5M
	b)	Explain how calomel electrode is used as a reference electrode to determine the potential of an unknown electrode.	K2	CO3	5M
OR					
7.	a)	Discuss the construction, working, applications of Lithium ion battery.	K3	CO3	5M
	b)	What is fuel cell? Explain the engineering applications of H ₂ -O ₂ fuel cell.	K2	CO3	5M
UNIT-IV					
8.	a)	Elaborate the different types of polymerization reactions with an example each.	K3	CO4	5M
	b)	Describe the preparation, properties and applications of Buna-S.	K2	CO4	5M
OR					
9.	a)	Discuss the preparation, properties and applications of Bakelite.	K3	CO4	5M
	b)	Explain the classification of conducting polymers. Mention applications.	K3	CO4	5M
UNIT-V					
10.	a)	State Beer-Lambert law. Write its limitations.	K1	CO5	4M
	b)	Describe with layout the function of different parts and working of typical geothermal power plant.	K2	CO5	6M
OR					
11.	a)	Discuss the various electronic transitions in molecules. Sketch diagram.	K3	CO5	5M
	b)	Explain the construction, working and applications of PV cell.	K2	CO5	5M