

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

**I B.Tech II Semester Regular Examinations, June-2024**

**CHEMISTRY  
(Common to CSE, CSE(AI&ML), CSE(AI) and CSE(DS))**

Time: 3 hours

Max. Marks: 70

**Note:**

- 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 10marks each. Student shall answer any one of them.

Q. No.	Questions	BTL	CO	Marks
1.	a) Write the significance of $\Psi$ and $\Psi^2$ .	K1	CO1	2M
	b) Brief about Molecular Orbital Theory.	K1	CO1	2M
	c) Give any two applications of Semiconductors.	K2	CO2	2M
	d) Write any two important properties of Graphene Nano particles.	K1	CO2	2M
	e) What are redox reactions giving an example with equation.	K1	CO3	2M
	f) Differentiate between Primary and Secondary cells.	K1	CO3	2M
	g) What is Step growth Polymerization, give an example.	K1	CO4	2M
	h) What are Bio-Degradable polymers give examples.	K1	CO4	2M
	i) Brief about Electromagnetic spectrum.	K1	CO5	2M
	j) Write any two applications of IR spectroscopy.	K1	CO5	2M
<b>UNIT-I</b>				
2.	a) Derive the Schrodinger's wave equation for a free particle.	K2	CO1	5M
	b) Draw the molecular orbital diagram of CO molecule and write its bond order.	K2	CO1	5M
<b>OR</b>				
3.	a) Discuss briefly about the calculation of Bond order with respect to MO theory.	K2	CO1	5M
	b) Draw the pi- molecular orbital energy level diagram of benzene molecule.	K2	CO1	5M
<b>UNIT-II</b>				
4.	a) Write a note on Super conductors and give their applications.	K2	CO2	5M
	b) Write the preparation, properties and applications of fullerenes.	K2	CO2	5M

OR					
5.	a)	Write a short note on Super capacitors.	K2	CO2	5M
	b)	Describe the preparation of CNT's by Arc-Discharge method.	K2	CO2	5M
UNIT-III					
6.	a)	Derive Nernst equation for single electrode potential and mention it's applications.	K2	CO3	5M
	b)	Write a short note on Polymer Electrolyte Membrane Fuel cell (PEMFC).	K2	CO3	5M
OR					
7.	a)	Describe the concept of cell potentials and give one example with calculation.	K2	CO3	5M
	b)	Write a short note on Lithium-ion batteries and give their applications.	K2	CO3	5M
UNIT-IV					
8.	a)	Differentiate between Thermo and Thermo setting plastics.	K3	CO4	5M
	b)	Explain the Mechanism of conduction and applications of Polyacetylene.	K2	CO4	5M
OR					
9.	a)	What is meant by Step Growth Polymerization and give its mechanism with an example.	K3	CO4	5M
	b)	Write the preparation, properties and applications of Buna – N rubber.	K2	CO4	5M
UNIT-V					
10.	a)	Explain the conversion of light into electrical energy in photovoltaic cells.	K2	CO5	5M
	b)	What are the basic principles of Chromatography and give its applications.	K2	CO5	5M
OR					
11.	a)	Explain the principals involved in UV Spectroscopy and write their applications.	K2	CO5	5M
	b)	Describe the construction, working of Hydro power plant and write the advantages of Hydro Power.	K2	CO5	5M