

Code: 23BS1102

I B.Tech - I Semester – Supplementary Examinations - JULY 2024**CHEMISTRY**
(Common for EEE, ECE, CSE)

Duration: 3 hours

Max. Marks: 70

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- 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.
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PART – A

1.a)	Differentiate between orbit and orbital.
1.b)	Write about the concept of bond order with an example.
1.c)	Explain semiconductors with an example.
1.d)	Classify nanomaterials and give examples of them.
1.e)	Differentiate between electrolytic cell and electrochemical cell.
1.f)	Explain the electrode potential with an example.
1.g)	Define conducting polymers and write two examples.
1.h)	Write the monomers of PVC and Bakelite.
1.i)	Explain the electromagnetic radiation and absorption spectroscopy.
1.j)	Explain the selection rule of IR spectroscopy.

PART – B

				Max. Marks
UNIT-I				
2	a)	Make use of neat diagram to explain the formation of pi molecular orbital in butadiene.	5 M	
	b)	Derive the Schrodinger wave equation and explain the significance of the terms involved.	5 M	
OR				
3	a)	Make use of neat diagram to explain energy level diagram of O ₂ molecule.	5 M	
	b)	Analyze the significance of homo and hetero nuclear diatomic molecules in the field of chemistry.	5 M	
UNIT-II				
4	a)	Explain the properties and applications of carbon nanotubes in detail.	5 M	
	b)	What are intrinsic semiconductors? Explain the conduction in <i>p</i> -type and <i>n</i> -type semiconductors.	5 M	
OR				
5	a)	Explain the classification and application of super capacitors.	5 M	
	b)	List out the applications of graphene and nanoparticle.	5 M	
UNIT-III				
6	a)	Describe the construction and working of Hydrogen-Oxygen Fuel cell with a neat diagram.	5 M	

	b)	Derive the Nernst equation and explain the terms involved in it. Write its applications.	5 M
OR			
7	a)	Explain the construction and working of Lithium batteries with a neat diagram and list out the advantages.	5 M
	b)	Write the half-cell and net reactions of the following cell: $\text{Zn/Zn}^{+2} (1\text{M}) \parallel \text{Cu}^{+2} (1\text{M})/\text{Cu}.$ Find the EMF of the above cell given $E^0 (\text{Zn}^{+2}/\text{Zn}) = - 0.76 \text{ V}$ and $E^0 (\text{Cu}^{+2}/\text{Cu}) = + 0.34 \text{ V}$.	5 M
UNIT-IV			
8	a)	Describe the properties, preparation and applications of carbon fibers.	5 M
	b)	Write a detailed step wise mechanism of Anionic polymerization.	5 M
OR			
9	a)	Explain the properties and preparation of nylon-6,6.	5 M
	b)	Distinguish between thermoplastic and thermosetting plastics.	5 M
UNIT-V			
10	a)	Describe the principle of UV Visible spectroscopy and explain the electronic transitions with a neat diagram.	5 M
	b)	Explain the principle and instrumentation of High-Performance Liquid Chromatography (HPLC) with a neat diagram.	5 M

OR

11	a)	Describe the principle and instrumentation of IR spectroscopy and its applications.	5 M
	b)	Explain the Beer-Lambert's law and relation between the absorbance and concentration.	5 M