PVP 23

Code: 23BS1102

I B.Tech - I Semester – Regular Examinations - JANUARY 2024

CHEMISTRY

(Common for EEE, ECE, CSE)

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)	Write notes on molecular orbital theory.	L2	CO1
1.b)	Write the significance of Ψ and Ψ^2.	L2	CO1
1.c)	Explain superconductors with an example.	L2	CO2
1.d)	Write about the nanomaterials and give examples.	L2	CO2
1.e)	Write about the secondary batteries with an example.	L2	CO2
1.f)	Explain about the Potentiometric sensor.	L2	CO2
1.g)	Outline the applications of PVC.	L2	CO3
1.h)	Explain polymerization with an example.	L2	CO3
1.i)	Explain the electromagnetic radiation and interaction with matter.	L3	CO3
1.j)	Describe the basic principle of UV-visible spectroscopy.	L2	CO3

PART – B

			BL	CO	Max. Marks
UNIT-I					
2	a)	Make use of neat diagram to explain the formation of pi molecular orbital in benzene.	L3	CO2	5 M
	b)	Derive the Schrodinger wave equation and explain the significance of the terms involved.	L4	CO4	5 M
OR					
3	a)	Make use of neat diagram to explain energy level diagram of O_2 molecule.	L3	CO2	5 M
	b)	Analyze the significance of homo and hetero nuclear diatomic molecules in the field of chemistry.	L4	CO4	5 M
UNIT-II					
4	a)	Classify super – capacitors based on their characteristics and explain them in detail.	L4	CO2	5 M
	b)	Describe the extrinsic semiconductor and its types. Explain the processes which are occurred during the formation of a P-N junction.	L3	CO4	5 M
OR					
5	a)	Explain the preparation, structure and properties of high temperature super conductor-$CaTiO_3$.	L3	CO2	5 M

	b)	List out the properties and applications of carbon nanotubes.	L4	CO4	5 M
		UNIT-III			
6	a)	Describe the construction and working of Hydrogen-Oxygen Fuel cell with a neat diagram.	L3	CO2	6 M
	b)	What is the emf of the following cell at 25°C Zn (s) | Zn^{2+} (0.2M) || Ag^{+} (0.002M) | Ag (s). The standard emf of the cell E° is 1.54 V.	L4	CO4	4 M
		OR			
7	a)	Explain the construction and working of Zinc-air battery with a neat diagram and list out the advantages.	L3	CO2	6 M
	b)	Write the half-cell and net reactions of the following cell: Zn/Zn^{+2} (1M) || Cu^{+2} (1M)/Cu Find the EMF of the above cell given E^0 (Zn^{+2}/Zn) = - 0.76 V and $E^0(Cu^{+2}/Cu)$ = + 0.34 V.	L4	CO4	4 M
		UNIT-IV			
8	a)	Describe the properties, preparation and applications of Bakelite.	L3	CO5	5 M
	b)	Write a detailed step wise mechanism of cationic polymerization.	L4	CO3	5 M
		OR			

9	a)	Explain the properties, preparation and applications of nylon-6,6.	L3	CO3	5 M
	b)	Write about the mechanism of conducting polymers and its applications with suitable example.	L4	CO5	5 M
		UNIT-V			
10	a)	Describe the Instrumentation and applications of IR spectroscopy.	L3	CO3	5 M
	b)	Explain the principle and instrumentation of High-Performance Liquid Chromatography (HPLC) with a neat diagram.	L4	CO5	5 M
		OR			
11	a)	Explain the Beer-Lambert's law statement and limitations.	L3	CO3	5 M
	b)	List out the characteristics of electromagnetic spectrum.	L4	CO5	5 M