PVP 23

Code: 23BS1202

I B.Tech - II Semester – Regular Examinations - JULY 2024

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)	What is the purpose of de-Broglie's relationship?	L2	CO1
1.b)	State the conditions for linear combination of atomic orbitals.	L2	CO1
1.c)	Mention the reasons for the unique behavior of nano materials.	L2	CO2
1.d)	List out the general applications of carbon nano tubes.	L2	CO2
1.e)	Differentiate between conductance and conductivity.	L3	CO4
1.f)	What is the potential of a half cell consisting of copper electrode in 0.015 M $CuSO_4$ solution at 25 °C , $E°_{Cu^{2+}}/Cu$ = 0.34 V.	L3	CO2
1.g)	Define the terms monomer, polymer and polymerization.	L2	CO5

1.h)	Give the monomers used in the synthesis of Nylon-6, 6.	L2	CO5
1.i)	Name two common types of vibrations that are detected in IR spectroscopy.	L2	CO3
1.j)	What is the basic principle involved in chromatography?	L2	CO3

PART – B

			BL	CO	Max. Marks
UNIT-I					
2	a)	Derive the Schrodinger wave equation and give its applications.	L2	CO1	5 M
	b)	Discuss the magnetic property of CO molecule with the help of neat molecular orbital energy level diagram.	L3	CO2	5 M
OR					
3	a)	Show that Heisenberg's uncertainty principle is a natural consequence of wave nature associated with moving material particles.	L3	CO2	5 M
	b)	Describe the stability of butadine using pi molecular orbital energy level diagram.	L3	CO2	5 M
UNIT-II					
4	a)	What are supercapacitors? Discuss the classification and applications of supercapacitors.	L4	CO4	5 M

	b)	Differentiate between intrinsic and extrinsic semiconductors.	L3	CO2	5 M
		OR			
5	a)	Compare and contrast the properties of fullerenes with those of graphenes.	L4	CO4	5 M
	b)	Discuss the structure of high temperature super conductors with the help of neat diagram and mention its applications.	L2	CO4	5 M
		UNIT-III			
6	a)	How do you differentiate between primary and secondary batteries? Explain the construction and working of Zn – air battery.	L3	CO4	5 M
	b)	Calculate the EMF of the following cell at 25^{O} C. $Cu(s)/Cu^{2+}(0.001M)//Ag^{+}(0.01\ M)/Ag(s)$ $E°(Cu^{2+}/Cu)=-0.34V, E°(Ag^{+}/Ag)=0.80$ V	L3	CO2	5 M
		OR			
7	a)	Derive Nernst equation. Mention its application in determination of pH of unknown acid.	L2	CO4	5 M
	b)	Make the use of neat diagram to explain the construction, working and applications of polymer electrolyte membrane furl cell.	L3	CO2	5 M

UNIT-IV					
8	a)	Differentiate between thermoplasts and thermosets.	L2	CO5	5 M
	b)	Write a note on synthesis of Poly Lactic acid and mention its properties and applications.	L2	CO5	5 M
OR					
9	a)	What are conducting polymers? Discuss the mechanism of conduction in poly aniline.	L3	CO3	5 M
	b)	Outline the synthesis of Bakelite. Mention its properties and applications.	L3	CO5	5 M
UNIT-V					
10	a)	List out the characteristics of electromagnetic spectrum.	L2	CO2	5 M
	b)	Describe the principle and instrumentation of UV-visible spectro scopy with the help of neat diagram.	L3	CO5	5 M
OR					
11	a)	How does the Beer-Lambert law account for the exponential decrease in light intensity with increasing concentration of absorbing species?	L4	CO5	5 M
	b)	Explain how IR spectroscopy is used to identify functional groups in organic molecules.	L3	CO5	5 M