BCHES102/202

First/Second Semester B.E./B.Tech. Degree Examination, June/July 2025
Applied Chemistry for CSE Stream

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. VTU Formula Hand Book is permitted.
3. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	What are electrochemical sensors? Explain its application in the measurement of dissolved oxygen.	07	L2	CO1
	b.	Describe the construction, working and applications of lithium ion battery.	07	L2	CO1
	c.	Explain the working principle of conductometric sensors.	06	L2	CO1
		OR			
Q.2	a.	Describe the application of electrochemical gas sensors for SO_x and NO_x.	07	L2	CO1
	b.	Describe the construction, working and applications of sodium ion battery.	07	L2	CO1
	c.	Explain the working principle of optical sensors.	06	L2	CO1
		Module – 2			
Q.3	a.	What are memory devices? Explain the classification of electronic memory devices with an example.	07	L2	CO2
	b.	Mention any four properties and applications of LCD.	07	L2	CO2
	c.	Mention any four properties and applications of QLED.	06	L2	CO2
		OR			
Q.4	a.	What are nano materials? Explain any four properties of polythiophenes (P_3HT) suitable for optoelectronic devices.	07	L2	CO2
	b.	Mention any four properties and applications of OLED.	07	L2	CO2
	c.	What are photoactive and electroactive materials.	06	L2	CO3
		Module – 3			
Q.5	a.	What is corrosion? Explain the electrochemical theory of corrosion with respect to iron.	07	L2	CO3
	b.	What is a cathodic protection? Explain sacrificial anodic method.	07	L2	CO3
	c.	What are concentration cells? Explain with an example.	06	L2	CO3

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		OR	M	L	C
Q.6	a.	What are reference electrodes? Explain the construction, working and applications of calomel electrode.	07	L2	CO3
	b.	Draw the nature of conductometric graph for the estimation of weak acid versus strong base and explain the nature of graph.	07	L2	CO3
	c.	Calculate the cell potential of the following concentration cell and comment on the spontaneity of the reaction $$Cu \mid Cu^{2+} (0.01\ M) \parallel Cu^{2+} (0.015\ M) \mid Cu$$	06	L2	CO3
		Module – 4			
Q.7	a.	What is number average and weight average molecular weight of polymer?	07	L2	CO4
	b.	What are conducting polymers? Explain the mechanism of conduction in polyacetylene.	07	L2	CO4
	c.	Explain the construction and working of photovoltaic cells.	06	L2	CO4
		OR			
Q.8	a.	Explain the preparation, properties and commercial applications of Kevlar.	07	L2	CO4
	b.	Explain the generation of energy (green hydrogen) by electrolysis of water and its advantages.	06	L2	CO4
	c.	Polymer sample contains six molecules having molecular weight of 1000 mol/kg. Five molecules having molecular weight of 2000 mol/kg and four molecules having molecular weight of 3000 mol/kg. Calculate number average and weight average molecular weight of polymer.	07	L3	CO4
		Module – 5			
Q.9	a.	Explain the characteristics and need of e-waste management.	07	L2	CO5
	b.	Explain the extraction of gold from e-waste.	07	L2	CO5
	c.	Explain the role of stake holders in environmental management of e-waste.	06	L2	CO5
		OR			
Q.10	a.	What is e-waste? Mention the sources and composition of e-waste.	07	L2	CO5
	b.	Explain any two different techniques used to recycling and recovery of e-waste.	07	L2	CO5
	c.	Mention any three toxic materials used in the manufacturing electronic products and electrical products and mention their health hazards.	06	L2	CO5

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