CBCS SCHEME

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BCHES102/202

First/Second Semester B.E./B.Tech. Degree Examination, June/July 2023
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 sensors? Explain how Electrochemical gas sensors used to detect SO_x and NO_x gases.	07	L1	CO1
	b.	With a neat sketch explain the measurement of dissolved oxygen by electro-chemical sensors.	06	L1	CO1
	c.	Explain the construction and working of Li-ion battery. Write the charging and discharging reaction.	07	L1	CO1
		OR			
Q.2	a.	Explain the construction and working of sodium ion battery. Write the charging and discharging reaction.	07	L1	CO1
	b.	Explain the detection of pharmaceutical pollutant dichlofenac using electrochemical sensor.	07	L1	CO1
	c.	What are disposable sensors? Explain the detection of ascorbic acid. Write the oxidation reaction.	06	L1	CO1
		Module – 2			
Q.3	a.	What are memory device? Briefly explain the classification of memory device.	07	L1	CO1
	b.	Explain organic memory devices of p-type and n-type by taking example of Pentacene.	06	L2	CO1
	c.	Discuss the application of liquid crystals in display devices.	07	L2	CO1
		OR			
Q.4	a.	What are Photoactive and Electroactive material? Briefly discuss their role in opto-electronic devices.	07	L1	CO1
	b.	What are liquid crystals? Briefly explain the classification of liquid crystals with example.	07	L2	CO1
	c.	Discuss the application of Polyimide Polymeric material for organic memory device.	06	L1	CO1
		Module – 3			
Q.5	a.	What is corrosion? Explain Electrochemical theory of corrosion taking iron as example.	07	L2	CO3

	b.	What are reference electrodes? Explain the construction and working of calomel electrode.	07	L2	CO3
	c.	Two cadmium rods immersed in Cadmium Sulphate solution of concentration 0.002 M and 0.4 M. Write the cell representation, cell reaction and calculate the EMF at 25°C.	06	L2	CO3
		OR			
Q.6	a.	What are ion selective electrode? Explain the determination of pH of an unknown solution using glass electrode.	07	L1	CO3
	b.	What is anodizing? Explain the anodizing of aluminium.	07	L1	CO3
	c.	A thick steel sheet of area 450 cm^2 is exposed to air near ocean. After one year it was found to experience a weight loss of 385g due to corrosion. Calculate the rate of corrosion in mpy and mmpy. [Density of specimen 7.9 g/cm^3, k = 534 for mpy and k = 87.6 for mmpy]	06	L1	CO3
		Module – 4			
Q.7	a.	Discuss the conduction mechanism of Polyacetylene.	07	L1	CO4
	b.	With a neat sketch, explain the generation of Hydrogen by Alkaline Electrolysis of water.	07	L1	CO4
	c.	In a polymer sample 20% of molecules have molecular mass 15000 g/mol, 35% molecules have molecular mass 25000 g.mol and remaining percentage have molecular mass 20000 g/mol. Calculate number average and weight average molecular mass of the polymer	06	L1	CO4
		OR			
Q.8	a.	What are PV cell? Explain the construction and working of PV cell.	07	L2	CO4
	b.	Explain the preparation, properties and application of graphene oxide.	07	L2	CO4
	c.	What is green fuel? Mention the advantages of green fuel.	06	L2	CO4
		Module – 5			
Q.9	a.	What are e-waste? Explain the sources and composition of e-waste.	06	L1	CO5
	b.	Discuss the various steps involved in recycling of e-waste.	07	L1	CO5
	c.	Write a note on various stakeholders in e-waste management.	07	L2	CO5
		OR			
Q.10	a.	Explain the various steps involved in extraction of gold from e-waste.	07	L2	CO5
	b.	Discuss the extraction of metals from e-waste by pyrometallurgy.	07	L2	CO5
	c.	What are the toxic metal used in electrical and electronics products? Discuss their ill effects.	06	L1	CO5

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