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BCHES102/202

First/Second Semester B.E./B.Tech. Degree Supplementary Examination, June/July 2024
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.	Define the following terms : i) Sensor ii) Transducer iii) Actuator	6	L1	CO1
	b.	Discuss the principle, working and applications of electro chemical sensors.	7	L2	CO1
	c.	Explain the detection of ascorbic acid using disposable sensor.	7	L2	CO1
		OR			
Q.2	a.	Define a battery. Give the classification of batteries with examples.	6	L1	CO1
	b.	Explain the construction and working of Li-ion battery. Mention any four applications.	7	L2	CO1
	c.	Discuss construction and working of Quantum Dot Sensitized Solar Cell. (QDSSC)	7	L2	CO1
		Module – 2			
Q.3	a.	Mention any Four properties and used of QLED.	6	L1	CO2
	b.	Discuss classification of liquid crystals. Mention any four properties and applications of liquid crystals.	7	L2	CO2
	c.	Explain the types of organic memory devices by taking P-type and n-type semiconducting materials.	7	L2	CO2
		OR			
Q.4	a.	Write any Four properties and applications of Polythiophenes (P_3HT) suitable for optoelectronic devices.	6	L1	CO2
	b.	What are memory devices? Explain the classification of electronic memory devices with suitable examples.	7	L2	CO2
	c.	Define optoelectronic device. Explain the working principle of optoelectronic device.	7	L2	CO2
		Module – 3			
Q.5	a.	Define metallic corrosion. Write the steps involved in the electro chemical theory of corrosion by taking rusting of Iron as an example.	6	L1	CO3

	b.	What is CPR? A thick brass sheet of area 400 inch^2 is exposed to moist air, after 2 years of period it was found to experience a weight loss 375g due to corrosion. If the density of brass is 8.73 g/cm^3, calculate CPR in mpy and mmpy units? K = 87.6 (mmpy), K = 534(mpy)	7	L2	CO3
	c.	Explain the principle, instrumentation and working of conductometry.	7	L2	CO3
		OR			
Q.6	a.	What are reference electrodes? Write the construction and working of calomel electrode with a neat labelled diagram.	6	L1	CO3
	b.	Define concentration cell? Emf of the cell Ag/Ag NO$_3$ (0.01M)//Ag NO$_3$ (X M)/Ag is 0.0659V at 298K. Write cell reactions and calculate the value of "x".	7	L2	CO3
	c.	Briefly explain the principle, instrumentation and working of potentiometry.	7	L2	CO3
		Module – 4			
Q.7	a.	What is green fuel? Mention the advantages of green fuel (Hydrogen).	6	L1	CO4
	b.	A polymer sample contains 100 molecules of mol. Mass is 2×10^4 g/mol 300 molecules of molecular mass 3×10^3 g/mol and 500 molecules of molecular mass 5×10^3 g/mol. Calculate the number and weight average molecular weight of polymer.	7	L2	CO4
	c.	Describe the generation of hydrogen gas by alkaline water electrolysis with a neat labelled diagram.	7	L2	CO4
		OR			
Q.8	a.	What is Photovoltaic cell? Write the construction and working of PV cell with a neat labelled diagram.	6	L2	CO4
	b.	Explain the preparation, properties and commercial applications of graphene oxide.	7	L2	CO4
	c.	Discuss the conduction mechanism in polyacetylene.	7	L2	CO4
		Module – 5			
Q.9	a.	Define e-waste? Mention the sources and composition of e-waste.	6	L1	CO5
	b.	Briefly discuss the various steps involved in recycling of e-waste.	7	L2	CO5
	c.	Explain health hazards due to exposure of e-waste.	7	L2	CO5
		OR			
Q.10	a.	Write a brief note on role of stake holders such as producers, consumers, recyclers and statutory bodies in managing the e-waste.	6	L1	CO5
	b.	Discuss the following: i) Pyrometallurgy ii) Hydrometallurgy.	7	L2	CO5
	c.	Explain the steps involved in the extraction of gold from e-waste.	7	L2	CO5

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