U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

September 2024 Supplementary Examinations

Programme: B.E. **Semester: I / II**
Branch: Computer Science Stream **Duration: 3 hrs.**
Course Code: 22CY1BSCCS / 22CY2BSCCS **Max Marks: 100**
Course: Applied Chemistry for Computer Science Stream

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

		UNIT - I	CO	PO	Marks
1	a)	Describe the construction and working of glass electrode. Elaborate its application in determination of pH of a solution.	1	1	**7**
	b)	Explain the electro-less plating of copper with relevant reactions and mention its advantages over electroplating.	1	1	**7**
	c)	A stainless-steel plate found in an acidic media, was estimated for an original area of 20 in^2 and weight loss of 1.2 kg due to corrosion. Assuming a CPR rate of 400 mpy, calculate the time in year for which it is exposed to corrosive media, the density is of stainless steel 7.87 g/cm^3.	2	2	**6**
		OR			
2	a)	Corrosion is an electrochemical phenomenon: justify the statement by taking corrosion of iron as a model.	1	1	**7**
	b)	What are concentration cells? The EMF of a concentration cell $Zn\|ZnNO_3(0.018\ M)\ \|\|ZnNO_3(X)\|Zn$ is found to be 0.083 V at 298 K. Write the cell reactions and calculate the value of X.	2	2	**7**
	c)	Explain corrosion protection used when a buried pipeline is attached with an Mg block.	3	7	**6**
		UNIT – II			
3	a)	What are Quantum Dot Sensitized Solar Cells (QDSSCs)? Elucidate the working principle and applications.	3	7	**7**
	b)	Describe the construction and working of Li-ion battery. Why protic solvents are not used in Li-ion batteries?	1	1	**7**
	c)	When 0.96 g of a chemical fuel subjected to complete combustion in a bomb calorimeter, the temperature of the surrounding water increased from 25.5 ^oC to 27.7 ^oC. The weight of water taken and water equivalent of bomb calorimeter were 3000 g and 365 g respectively. Calculate GCV and NCV of fuel. (Given: Specific heat of water = 4.186 kJ/kg/^oC, Latent heat of steam is 2454 kJ/kg.	2	2	**6**

			UNIT – III			
	4	a)	Write the synthesis of following: (i) PMMA and (ii) butyl rubber. Mention their applications.	1	1	**7**
		b)	Describe the synthesis and application of Kevlar fibers. Appraise that statement: Kevlar is less flexible than nylons.	1	1	**7**
		c)	A polymer sample has the following composition, 20% molecules have molecular mass 15000 g/mol, 35% molecules have molecular mass 25000 g/mol and remaining molecules have molecular mass 20000 g/mol. Calculate the number average and weight average molecular mass of the polymer. Calculate PDI and comment on it.	2	2	**6**
			OR			
	5	a)	Define Tg of a polymer. Discuss the influence of crystallinity and flexibility of a polymer chain on Tg.	1	1	**7**
		b)	What are conducting polymer? Explain the oxidative doping of polyacetylene to enhance its conductivity.	1	1	**7**
		c)	Describe the synthesis and uses of polyglycolic acid.	3	7	**6**
			UNIT – IV			
	6	a)	What are memory devices? Explain the classification of electronic memory devices with suitable examples.	1	1	**7**
		b)	Describe the importance of Jablonski's diagram. Elaborate on electronic transitions in it.	1	1	**7**
		c)	Explain the classification of liquid crystals with suitable examples.	1	1	**6**
			UNIT – V			
	7	a)	What are electrochemical sensors? Explain its importance and application in the sensing of NOx.	1	1	**7**
		b)	Define COD. In COD test, 28.1 cm^3 and 14.0 cm^3 of 0.01 N FAS solution were required for blank and back titration respectively. The volume of waste water used is 25 cm^3. Calculate the COD of the sample given.	2	2	**7**
		c)	What is an e-waste? Explain the health hazard due to exposure to e-waste.	3	7	**6**

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