U.S.N.										

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

Autonomous Institute Affiliated to VTU

October 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.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		UNIT - I	CO	PO	Marks
1	a)	Elaborate on the anodizing and phosphating process for corrosion control.	1	1	**8**
	b)	Discuss the electrochemical theory of corrosion by taking iron as an example.	1	1	**6**
	c)	What are concentration cells? EMF of the cell $Cd\|CdSO_4(0.003\ M)\|\|CdSO_4(x\ M)\|Cd$ is 0.086 V at 298K. Find out the value of x.	2	2	**6**
		OR			
2	a)	What are ion-selective electrodes? Discuss the construction and working of glass electrode. Derive an expression for pH of an unknown solution.	1	1	**8**
	b)	Discuss the effect of (i) polarization, and (ii) nature of the corrosion product on corrosion rate.	2	2	**6**
	c)	Define the corrosion penetration rate (CPR). A thick brass sheet of area 400 $inch^2$ is exposed to moist air. After two years it was found to experience a weight loss of 375 g due to corrosion. Density of brass is 8.73 g/cm^3 and K =534. Calculate CPR in mpy.	2	2	**6**
		UNIT - II			
3	a)	Define GCV and NCV. Elaborate on the determination of calorific values of a solid fuel using a bomb calorimeter.	1	1	**8**
	b)	What is renewable energy? Explain the production of bio-diesel.	3	7	**6**
	c)	Explain the construction and working of a quantum-dot sensitized solar cell.	3	7	**6**
		UNIT - III			
4	a)	Define glass transition temperature. Highlight its significance. Discuss the effect of (i) Intermolecular forces, and (ii) molecular weight on Tg.	2	2	**8**
	b)	Elaborate on the synthesis of urea-formaldehyde resin. Mention its applications.	1	1	**6**

		c)	Discuss the synthesis and applications of (i) nitrile rubber, and (ii) PMMA.	1	1	**6**
			OR			
	5	a)	Discuss the relevance of biodegradable polymers. Elaborate on the synthesis and degradation of polyglycolic acid.	1,3	1,7	**8**
		b)	What are conducting polymers? Elaborate on the mechanism of conduction of polyacetylene.	1	1	**6**
		c)	For a polymer sample containing 100 molecules each of molecular weights 20000, 50000, and 60000, calculate $\bar{M}n$, $\bar{M}w$, and PDI.	2	2	**6**
			UNIT - IV			
	6	a)	What is liquid crystalline behavior? Elaborate on the classification of liquid crystal.	1	1	**8**
		b)	Discuss the classification of materials for electronic memory storage applications.	1	1	**6**
		c)	Elaborate on the working of QLED.	3	7	**6**
			UNIT - V			
	7	a)	Define COD and BOD. A 25 cm^3 of polluted water was boiled with 10 cm^3 of 0.25 N $K_2Cr_2O_7$ in the presence of H_2SO_4 (containing Ag_2SO_4 + $HgSO_4$). The unreacted $K_2Cr_2O_7$ required 6.1 cm^3 of 0.1 N FAS. 10 cm^3 of 0.25 N $K_2Cr_2O_7$ when titrated under same condition required 25 cm^3 of 0.1 N FAS. Calculate COD.	2	2	**8**
		b)	Elaborate on the extraction of copper from e-waste.	1,3	1,7	**6**
		c)	Discuss the working of conductometric sensors used for the estimation of the acid mixture.	5	1,2	**6**

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