U.S.N.										

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

Autonomous Institute Affiliated to VTU

February / March 2024 Semester End Main Examinations

Programme: B.E. **Semester: I / II**
Branch: Electrical Stream **Duration: 3 hrs.**
Course Code: 22CY1BSCEE / 22CY2BSCEE **Max Marks: 100**
Course: Applied Chemistry for Electrical Engineering 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)	What is surface conversion coating? Explain anodization of aluminum.	*1*	*1*	**7**
	b)	What are concentration cells? A galvanic cell is obtained by combining two cadmium electrodes immersed in cadmium sulphate solutions of concentrations 0.025 and 0.25M at 31^{o}C. Give the cell representation, cell reaction and calculate the EMF of the cell.	*CO2*	*PO2*	**7**
	c)	Predict the type of corrosion that may occur in the following cases and explain the same. i) Copper tap fitted to iron tank and ii) An iron screw fitted on the wooden surface.	*CO3*	*PO7*	**6**
		OR			
2	a)	Explain the electrochemical theory of corrosion by taking iron as an example.	*CO3*	*PO7*	**7**
	b)	Explain the construction and working of calomel electrode with suitable reactions. Mention its advantages.	*CO2*	*PO2*	**7**
	c)	What is electroless plating? Mention any four differences between electroplating & electroless plating.	*CO1*	*PO1*	**6**
		UNIT - II			
3	a)	Define GCV and NCV. Solve for the gross and net calorific values of a sample of coal from the following data: mass of coal =1.2g; mass of water = 3200g; water equivalent of calorimeter = 500g; specific heat of water = 4.187 kJ/kg/K; rise in temperature = 4.1 K; % of hydrogen in coal = 5; latent heat of steam = 2454 kJ/kg.	*CO2*	*PO2*	**7**
	b)	Analyse the advantages of i) Hydrogen as a fuel and ii) Biodiesel	*CO1*	*PO1*	**7**
	c)	With a neat labeled diagram explain the construction and working of photovoltaic cell. Mention its advantages.	*CO3*	*PO7*	**6**

			UNIT - III			
	4	a)	Explain the synthesis, properties and applications of Kevlar.	*CO2*	*PO2*	**7**
		b)	What are conducting polymers? Explain the mechanism of conduction in polymers by taking polyacetylene as an example	*CO3*	*PO7*	**7**
		c)	Describe the synthesis of PMMA and UF resin.	*CO1*	*PO1*	**6**
			OR			
	5	a)	A polymer sample contains 25% molecules having molecular mass 30000, 40% molecules having molecular mass 50000 and remaining molecules having molecular mass 65000 respectively. Solve for the number average and weight average molecular mass of the polymer. Calculate PDI.	*CO2*	*PO2*	**7**
		b)	Define Tg. Explain the significance of Tg. Elaborate the following factors influences the Tg i) Flexibility and ii) Molecular mass	*CO1*	*PO1*	**7**
		c)	Outline the synthesis of the following polymers i) Butyl rubber ii) Nitrile rubber	*CO2*	*PO2*	**6**
			UNIT - IV			
	6	a)	What are liquid crystals? Elaborate on the classification of liquid crystals.	*CO1*	*PO1*	**7**
		b)	What are quantum dot light emitting diodes (QLEDs). Describe the construction and working of QLEDs. Mention its properties.	*CO2*	*PO2*	**7**
		c)	Explain the classification of materials as conductors, semiconductors and insulators based on band theory.	*CO1*	*PO1*	**6**
			UNIT - V			
	7	a)	Describe the synthesis of carbon nanotubes by chemical vapour deposition (CVD) method. Mention the advantages and disadvantages of this method.	*CO1*	*PO1*	**7**
		b)	Explain the principle, instrumentation and the application of conductometric sensor.	*CO2*	*PO2*	**7**
		c)	Describe the advantages of recycling of e-waste.	*CO1*	*PO1*	**6**

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