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: Electrical Engineering 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 are secondary reference electrodes? Explain the construction and working of calomel electrode.	CO1	PO1	**6**
	b)	What are concentration cells? Calculate the value for concentration 'X' in the cell $Cd\|CdSO_{4\,(XM)}\|\|CdSO_{4\,(0.025M)}\|Cd$ having E_{cell} = 0.035 V at 28 °C. Given that R = 8.314 J/K/Mol and F = 96500 C. Also, what is the value for E_{cell} if both the concentrations are same?	CO2	PO2	**6**
	c)	Explain the following factors affecting the rate of corrosion: i) ratio of anodic to cathodic area ii) nature of corrosion product iii) pH.	CO2	PO2	**8**
		OR			
2	a)	Describe the metal finishing processes: (a) anodizing and, (b) phosphating	CO1	PO1	**8**
	b)	Pitting corrosion is an example for differential aeration corrosion. Justify it with suitable reactions.	CO1	PO1	**6**
	c)	Illustrate the determination of pH of a solution by using glass electrode.	CO1	PO1	**6**
		UNIT – II			
3	a)	Define GCV and NCV. On burning 0.75 g of a fuel in a bomb calorimeter, the temperature of 2.5 kg water is increased from 24 °C to 28 °C. The water equivalent of calorimeter and latent heat of steam are 0.485 kg and 2454 kJ/kg respectively. Specific heat of water is 4.18 kJ/kg/°C. If the fuel contains 2.5% hydrogen, calculate its gross and net calorific values.	CO2	PO2	**8**
	b)	Cite any two advantages of hydrogen gas as a fuel. Describe the production of biodiesel by transesterification method.	CO3	PO7	**6**
	c)	What is shelf life of a battery? Explain construction and working of a lithium ion battery.	CO1	PO1	**6**

SUPPLEMENTARY EXAMS 2024

			UNIT – III			
	4	a)	A polymer sample contains 50 molecules having molecular weight 2000, 40 molecules having molecular weight 3000, 30 molecules having molecular weight 4000. Calculate number average molecular weight, weight average molecular weight and PDI.	CO2	PO2	**6**
		b)	Write synthesis reaction for PMMA and Kevlar. Give one application for each.	CO1	PO1	**6**
		c)	What are biodegradable polymers? Explain synthesis, degradation and uses of polyglycolic acid.	CO3	PO7	**8**
			OR			
	5	a)	Define Tg and mention its significance. Discuss the following factors affecting Tg: i) flexibility ii) plasticizers.	CO2	PO2	**8**
		b)	Write synthesis, properties and applications of nitrile rubber.	CO1	PO1	**6**
		c)	What are conducting polymers? Explain the mechanism of conduction in polyacetylene	CO1	PO1	**6**
			UNIT – IV			
	6	a)	Define electronic grade silicon. Describe the Czochralski's crystal pulling technique.	CO1	PO1	**6**
		b)	Explain the concept of electronic memory and discuss any two classifications of electronic memory materials.	CO1	PO1	**8**
		c)	What are optoelectronic devices? Describe the construction and working of QLEDs.	CO3	PO7	**6**
			UNIT – V			
	7	a)	What are nanomaterials? Describe the preparation of CNTs by chemical vapor deposition (CVD) method and cite any two advantages of this method.	CO1	PO1	**6**
		b)	Explain the construction and working of electrochemical gas sensors. Justify the importance of gas sensors in environmental health and safety.	CO3	PO7	**6**
		c)	Discuss the effects of e-waste on environment. Appraise the importance of copper extraction from e-waste to the environment.	CO3	PO7	**8**

SUPPLEMENTARY EXAMS 2024

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