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MOBILE PHONES PROHIBITED

CHEE

Siddaganga Institute of Technology, Tumakuru-572 103

(An Autonomous Institution affiliated to VTU, Belagavi, Approved by AICTE, New Delhi)

Supplementary Semester B.E. Electrical and Electronics Engg. Examinations Oct.-Nov. 2023

Chemistry for EEE Stream

Time: 3 Hours **Max. Marks: 100**

Note : 1. Revealing of Identity in any form in the answer book/graph sheet will be treated as malpractice.
2. Answer any five questions choosing one full question from each unit.

			M	BL	CO	PO	PSO
		Unit - I					
1	a)	What is concentration cell? Derive an expression for the emf of a concentration cell.	5	3	1	1	
	b)	What are reference electrodes? Write the construction and working of calomel electrode.	5	1	1	1	
	c)	What are electrochemical cells? Give the difference between galvanic and electrolytic cells.	5	1	1	1	
	d)	A tin electrode and a silver electrode are coupled to form a cell. The concentration of Sn^{2+} and Ag^{+} are $4.84x10^{-4}$M and $2.2x10^{-2}$ M respectively. Write the representation of the cell, electrode reactions and calculate the EMF of the cell at 298K. Given $E^{0}_{sn^{2+}\|S_n}$ = 0.14V and $E^{0}_{Ag^{+}\|A_g}$ = 0.8V.	5	3	1	1	
		OR					
2	a)	What are Ion selective electrodes? Write the construction and working of glass electrode.	5	1	1	1	
	b)	Two copper rods are placed in copper sulphate solution of equal concentration are connected to form a concentration cell. What is the cell voltage? If one of the solutions is diluted until the concentration of Cu^{2+} ions is $1/5^{th}$ of its original value. What is the cell voltage after dilution at 298K.	5	3	1	1	
	c)	Discuss the construction and working of Calomel electrode.	5	2	1	1	
	d)	With an example write the construction and working of galvanic cell.	5	1	1	1	
		Unit - II					
3	a)	Derive Beer-Canbert's law.	5	3	2	2	
	b)	What are the advantages of instrumental methods over conventional methods of chemical analysis?	5	1	2	2	
	c)	What are Batteries? How it works during discharging.	5	1	2	2	
	d)	Write the construction and working of Li-MnO_2 battery.	5	2	2	2	
		OR					
4	a)	Explain the construction and working of Zinc-Air battery.	5	2	2	2	
	b)	What are reverse batteries? Write the components required for the lead-acid battery.	5	1	2	2	
	c)	How does the conductance vary in the case of mixture of strong acid and weak acid against strong base.	5	1	2	2	
	d)	How to estimate the iron present in the given solution in the redox reaction using Potentiometer?	5	2	2	2	

Please Turn Over

Unit - III

5	a)	What are Carbon nanotubes? Discuss the applications of CNTS.	5	2	3	2
	b)	What are nanomaterials? Explain different types of nanomaterials based on their composition.	5	2	3	2
	c)	How is Biodiesel prepared? Mention its advantages.	5	1	3	2
	d)	Define the term: i) Atom economy ii) Fuel cell iii) Power alcohol.	5	1	3	2
		OR				
6	a)	Distinguish between Top-down and Bottom-up process.	5	4	3	2
	b)	Explain the synthesis of T_1O_2 by hydrothermal method.	5	2	3	2
	c)	Describe the construction and working of methanol-oxygen fuel cell.	5	2	3	2
	d)	Justify your answers for the following: i) Fuel cells are ecofriendly ii) A membrane is inserted close to the cathode in the methanol-oxygen fuel cell.	5	5	3	2

Unit - IV

7	a)	Explain the corrosion of iron based on electrochemical theory.	5	2	4	1
	b)	Give an account of phosphating employed in corrosion control.	5	2	4	1
	c)	What is recycling? Explain the advantages of recycling of E-wastes.	5	1	4	1
	d)	What are e-wastes? List out major sources of e-wastes.	5	2	4	1
		OR				
8	a)	Explain the hydrometallurgical process of recovery of gold from e-waste.	5	2	4	1
	b)	Explain the methods of disposal of e-waste.	5	2	4	1
	c)	Give reason for the following: i) Why does metal corrodes below water line? ii) Aluminium articles are self-protected against corrosion in air.	5	3	4	1
	d)	Explain anodizing of Aluminium.	5	2	4	1

Unit - V

9	a)	What are conducting polymer? Write the mechanism of conduction in polyacetylene by oxidative doping.	5	2	5	2
	b)	What are polymers? Differentiate thermoplastics from thermosetting polymers.	5	3	5	2
	c)	What are liquid crystals? Write the classification of liquid crystals.	5	1	5	2
	d)	Define Light emitting diode. Write the Properties of LED's.	5	1	5	2
		OR				
10	a)	Write the synthesis of PMMA and mention its applications.	5	1	5	2
	b)	Give the synthesis of Teflon. Write its properties.	5	1	5	2
	c)	Differentiate between LCD and LED.	5	3	5	2
	d)	Explain the mechanism of conduction in solids.	5	2	5	2

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