03GXCYT122122404

Reg No.:

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APJ ABDUL KAŁAM TECHNOLOGICAL UNIVERSITY

First Semester B.Tech Degree Regular Examination December 2024 (2024 Scheme)

Course Code: GXCYT122

Course Name: CHEMISTRY FOR INFORMATION SCIENCE / ELECTRICAL SCIENCE Max. Marks: 60 Duration: 2 hours 30 minutes

		PART A		
		(Answer all questions. Each question carries 3 marks)	CO	Marks
1		Write any three differences between electrochemical series and galvanic	CO1	(3)
		series.		
2		What is a fuel cell? Write the chemical reactions happening at the anode and	CO1	(3)
		cathode in a H ₂ -O ₂ fuel cell with an acid electrolyte.		
3		Write any three applications of carbon nanotubes (CNTs).	CO2	(3)
4		How is polyaniline synthesised?	CO2	(3)
5		Write any three applications of Dielectric Thermal Analysis (DETA).	CO3	(3)
6		Which of the following will have higher λ_{max} value- ethene or 1,3-butadiene?	CO3	(3)
		Explain.		
7		What is COD? Give its significance.	CO4	(3)
8		Calculate the temporary, permanent and total hardness of water with the	CO4	(3)
		following salts: $Ca(HCO_3)_2 = 6$ ppm, $Mg(HCO_3)_2 = 8$ ppm, $CaSO_4 = 10$ ppm,		
		$MgSO_4 = 15 ppm$		
		PART B (Answer any one full question from each module, each question carries 9 mar	rks)	
2		Module -1		
9	a)	Discuss the design of a glass electrode and explain how a glass electrode can	CO1	(6)
		be employed in the measurement of pH of a solution.		
	b)	How sacrificial anodic protection can be used for the prevention of corrosion.	COI	(3)
10	a)	Describe the construction and working of Li ion cell.	COI	(6)
	b)	Write any three applications of electrochemical series.	CO1	(3)

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Module -2

11	a)	How are nanomaterials classified based on dimension?	CO2	(6)
	b)	Give a brief account of the materials used for supercapacitors.	CO2	(3)
12	a)	Write any three applications of Dye Sensitised Solar Cells (DSSCs).	CO2	(3)
	b)	What is fire retardant polymers? Cite any two examples for halogenated fire retardant polymers?	CO2	(3)
	c)	Write any three materials used in quantum computing technology.	CO2	(3)
		Module -3		
13	a)	Describe the instrumentation of scanning electron microscope (SEM).	CO3	(6)
	b)	State Beer Lambert's Law. Write the mathematical expression.	CO3	(3)
14	a)	Explain the various electronic transitions in electronic spectroscopy.	CO3	(6)
	b)	Discuss the IR activity of various vibrational modes of CO ₂ molecule.	CO3	(3)
		Module -4		
15	a)	Describe trickling filter method in the sewage water treatment.	CO4	(3)
	b)	Write the principle and any two advantages of reverse osmosis.	CO4	(3)
	c)	Discuss any three sustainable development goals.	CO4	(3)
16	a)	Explain the principle and procedure of ion exchange process.	CO4	(6)
	b)	Discuss the chemistry behind ozone depletion.	CO4	(3)

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