

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S2 (R) Exam May 2025 (2024 Scheme)

Course Code: GXCYT122



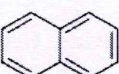
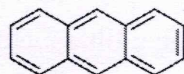
Course Name: CHEMISTRY FOR INFORMATION SCIENCE / ELECTRICAL SCIENCE

Max. Marks: 60

Duration: 2 hours 30 minutes

## PART A

*(Answer all questions. Each question carries 3 marks)*

		CO	Marks
1	Write the anode, cathode reactions and calculate the standard EMF of the cell formed by silver and aluminium electrodes. Given that $E_{\text{Ag}^+/\text{Ag}}^0 = 0.8\text{V}$ and $E_{\text{Al}^{3+}/\text{Al}}^0 = -1.66\text{V}$ .	CO1	(3)
2	Explain single electrode potential.	CO1	(3)
3	What are conducting polymers? Give two examples.	CO2	(3)
4	Explain the sol-gel method for synthesis of nanomaterials.	CO2	(3)
5	How IR spectroscopy can be used for distinguishing intra and inter molecular hydrogen bonds?	CO3	(3)
6	Predict which of the following molecules will have highest $\lambda_{\text{max}}$ in UV-visible spectrum. Justify your reason.	CO3	(3)
	a.  b.  c.  d. 		
7	Define dissolved oxygen. Give one significance of dissolved oxygen.	CO4	(3)
8	Explain water disinfection by chlorination.	CO4	(3)

## PART B

*(Answer any one full question from each module, each question carries 9 marks)*

## Module -1

9	a) Explain the construction and working of Li-ion cell.	CO1	(6)
	b) Explain impressed current cathodic protection.	CO1	(3)
10	a) Discuss the construction and working of $\text{H}_2\text{-O}_2$ fuel cell using acid electrolyte. Give one advantage of $\text{H}_2\text{-O}_2$ fuel cell.	CO1	(6)



- b) Define reference electrodes. Give one example for primary and secondary reference electrode. CO1 (3)

### Module -2

- 11 a) Discuss the construction and working of OLED. Give any two advantages of OLED. CO2 (6)
- b) Give any three applications of fullerenes. CO2 (3)
- 12 a) Describe the synthesis of polyaniline. List any two properties and applications of polyaniline. CO2 (6)
- b) Write any three materials used in spintronics. CO2 (3)

### Module -3

- 13 a) Explain the various modes of vibrations possible for CO<sub>2</sub> and H<sub>2</sub>O and state which of these modes are IR active. CO3 (6)
- b) List any three applications of SEM. CO3 (3)
- 14 a) Discuss the instrumentation and working of UV-Visible spectrometer. CO3 (6)
- b) Calculate the concentration of a solution if it shows a transmittance of 20% when taken in a cell of 2 cm thickness (Molar absorption coefficient is 12000 dm<sup>2</sup> mol<sup>-1</sup> ). CO3 (3)

### Module -4

- 15 a) What is Greenhouse effect. Name any two greenhouse gases. CO4 (3)
- b) Explain trickling filter method of sewage treatment CO4 (3)
- c) List any three disadvantages of hard water. CO4 (3)
- 16 a) Explain the principle and procedure of ion exchange process of water softening. CO4 (6)
- b) Calculate the temporary and permanent hardness of water sample containing the following dissolved salts.  
Mg(HCO<sub>3</sub>)<sub>2</sub> = 8 mg/L; Ca(HCO<sub>3</sub>)<sub>2</sub> = 6 mg/L; CaSO<sub>4</sub> = 8 mg/L, MgSO<sub>4</sub> = 10 mg/L CO4 (3)

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