LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

U.G. DEGREE EXAMINATION – **ALLIED**

SECOND SEMESTER – **APRIL 2025**

UCH2AR03 – CHEMISTRY FOR PHYSICS

Date: 05-05-2025 Dept. No. Max. : 100 Marks

Time: 09:00 AM - 12:00 PM

		SECTION A - K1 & K2 (CO1)
Q.No	Levels	**Answer ALL the Questions** **(10 x 2 = 20)**
1	K1	Define mole fraction.
2		What are ambidentate ligands?
3		A solution has pOH of 11.00. What is the pH of the solution?
4		State rate law in kinetics.
5		Mention any two methods to remove temporary hardness.
6	K2	Give any two examples of secondary standard.
7		Write the IUPAC name of the following complexes: a) $[CoCl_3(NH_3)_3]$ b) $[Fe(CO)_5]$
8		Mention the limitations of lead acid battery.
9		State Stark-Einstein law of photochemical equivalence.
10		List the disadvantages of hard water in boilers.
		SECTION B – K3 & K4 (CO2)
		Answer ALL the Questions **(4 x 10 = 40)**
11	K3	a) List the requisites of a primary standard and give two examples. b) Explain relative and absolute errors. (5+5)
		[OR]
12		What are ligands? Classify them with suitable examples.
13		a) Illustrate Arrhenius and Lewis concepts of acids and bases with examples. b) Discuss the hybridization and geometry of $[CoF_6]^{3-}$. (5+5)
		[OR]
14		Outline the construction and working of Lead-acid battery with a neat diagram.
15	K4	a) State the postulates of Werner's coordination theory. b) Compare order and molecularity of a reaction. (5+5)
		[OR]
16		a) Summarize the principle, working and applications of reverse osmosis process. b) Outline the role of activated charcoal in the water purification process**.** (7+3)
17		a) Differentiate thermal and photochemical reactions. b) Sketch Jablonski diagram and explain the fluorescence and phosphorescence. (5+5)
		[OR]
18		Differentiate between molarity, molality, and normality. A solution is prepared by dissolving 5 g of NaOH in 250 mL of water. Calculate its molarity. (Molar mass of NaOH = 40 g/mol)

SECTION C – K5 & K6 (CO3)		
	Answer ALL the Questions	**(2 x 20 = 40)**
19	K5	a) Enumerate the safety rules to be followed in storing chemicals and while doing experiments in the chemistry laboratory. (10) b) Explain the hybridisation, geometry and magnetism of the following compounds based on valence bond theory. (5+5) (i) $K_4[Fe(CN)_6]$ (ii) $[Ni(CO)_4]$
		[OR]
20		a) Illustrate the working principle of lithium-ion battery with a neat diagram. b) Enumerate the factors affecting the rate of the reaction. (10+10)
21	K6	a) Differentiate between electrochemical and electrolytic cells and explain the cell representation with an example. b) Derive the rate expression for the rate constant and half- life of a first order reaction. (10+10)
		[OR]
22		a) How will you estimate the hardness of water using EDTA titration method? b) Distinguish temporary and permanent hardness of water. c) Discuss the importance of water purification in daily life and industrial applications. (10+4+6)
