

**VIT**Vellore Institute of Technology
Creating the Future Through Education**SCHOOL OF ADVANCED SCIENCES****Department of Chemistry****Fall Semester 2023-24****Continuous Assessment Test – I****Duration : 90 Minutes****Slot: G2+TG2****Max. Marks: 50****Course Code:** CHY1701**Course Name:** Engineering Chemistry**Class Numbers:** VL2023240106221**Faculty Names:** Dr. Rajagopal D

QN	Answer <u>ALL</u> the questions (5 x 10 = 50 Marks)	Marks	CO	BL
1	Discuss on the following with appropriate chemical formula/equations; (a) Scale and sludge (b) Priming and foaming (c) Caustic embrittlement	10	CO1	L1
2	(a) 0.28 gm of CaCO_3 was dissolved in HCl and the solution was made up to one liter with distilled water. 100 mL of this solution required 28 mL of EDTA solution. 100 mL of hard water sample required 33 mL of EDTA solution on titration. 100 mL of boiled, cooled and filtered hard water consumed 10 mL of EDTA solution. Calculate temporary, permanent and total hardness. (b) Write down the chemical reactions taking place during the estimation of Dissolve Oxygen (D.O.) by Winkler's Method. Discuss the reason for color change at the end point.	(5 + 5)	CO1	L5
3	(a) Calculate the quantity of lime and soda required for softening 20,000 litre of water containing the following salts per litre $\text{Ca}(\text{HCO}_3)_2 = 8.1$ mg; $\text{Mg}(\text{HCO}_3)_2 = 7.5$ mg; $\text{CaSO}_4 = 13.6$ mg; $\text{MgSO}_4 = 12.0$ mg; $\text{MgCl}_2 = 2.0$ mg; and $\text{NaCl} = 4.7$ mg. Atomic weight of the elements are as follows. [Mg: 24, Ca: 40, S: 32, Na: 23, Fe: 56 and Cl: 35.5]. (b) Discuss on Break Point chlorination with a diagram.	(5 + 5)	CO1	L4
4	(a) Identify and elaborate on a process for brackish water (saline) treatment. (b) Briefly write down the activated carbon filtration process in details.	(5 + 5)	CO1	L3
5	Discuss in details on the demineralization of water by ion exchange resin with advantages and disadvantages.	10	CO1	L2