VIT'

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act 1956)

SCHOOL OF ADVANCED SCIENCES

B.Tech. Winter Semester 2018-19

Continuous Assessment Test–I, January 2019

Course Code : CHY1701	
Course name : Engineering Chemistry	Duration : 90 min.
Semester : Winter 2018-2019	Max. Marks : 50
	Slot : A1+TA1

Engineering Chemistry **Course Outcomes (CO)** for Module-1 & Module-2	
Upon the completion of the course, students shall have ability to:	Code
Understand the principle and working of lime-soda process, zeolites, ion-exchange resins, reverse osmosis, electro dialysis etc	[U]
Apply the knowledge of water treatment processes and solving the problems in engineering field	[A]

	Answer **ALL** the Questions	CO	Marks
1.	What is dissolved Oxygen? State the relationship between dissolved oxygen content and water quality. Discuss the method of determination with reactions and any two methods of removal.	[U]	10
2.	How water is softened using cold lime soda process? Discuss the process with a neat diagram and write the formula to calculate the lime and soda requirement.	[A]	10
3.	Explain the resin based ion-exchange process to treat the hard water with a neat diagram. How exhausted resins are regenerated? Explain why hard water should be passed through cation exchanger first then anion exchanger.	[U]	10
4 (a)	Explain break point chlorination with suitable graphical representation. Give its advantages.	[U]	5
(b)	"A single molecule of magnesium chloride is enough to corrode entire boiler material". Justify the statement with chemical reactions.	[A]	5
5 (a)	Why Reverse osmosis method of purification of water is known as super filtration? List out the advantages of this method and give examples of membranes used in RO.	[U]	5
(b)	Standard hard water is prepared by dissolving 1.5 g of $CaCO_3$ per litre. 50 mL of this standard hard water consumed 20 mL of EDTA during titration. 50 mL of a sample hard water consumed 25 mL of EDTA solution. 50 mL of water after boiling and filtering consumed 18 mL of EDTA. Calculate the Total, temporary and permanent hardness of water in ppm.	[A]	5

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