VIT
Vellore Institute of Technology

School of Advanced Sciences/ Department of Chemistry
Fall Semester 2022-23
Continuous Assessment Test - II

Course Code : BCHY101L
Course Name : Engineering Chemistry
Duration: 90 Minutes **Max. Marks :** 50
Slot : E1+TE1

Note: Students are allowed to carry one hand-written notebook and one textbook to the examination. The use of scientific calculators is permitted.

Q. No.	Answer ALL the questions (5 X 10 = 50 Marks)	Marks
1	For the acid-catalyzed reaction of ethyl acetate determine the rate constant of the reaction with the data given below. Also, determine the order and molecularity of the reaction. V_∞ for the reaction is 51.6 mL.	10
2	**a)** 1 mol of an ideal gas expands reversibly from a volume of 40 dm^3 and 293 K to a volume of 80 dm^3 and temperature 255 K. Assuming $C_v = 3/2\ R$, calculate the entropy change for the process. Comment on the feasibility of the process. **b)** Account for the entropy changes in reversible and irreversible processes. How does this lead to the development of the second law of thermodynamics in terms of entropy?	(5 + 5)
3	**a)** Name the products and the biocatalyst used in the biocatalysis of H_2O_2. Apply the enzyme catalysis to the reaction and predict the mechanism. **b)** Calculate the emf of the cell, Zn / Zn^{2+} (0.005M) // Ag^+ (0.01M) /Ag. given $2Ag^+ + 2e$ ——— $2Ag$ $E^0 = +0.80$ V and Zn ——— $Zn^{2+} + 2e$ $E^0 = -0.76$ V at 25 °C. Also, predict whether the cell reaction is spontaneous or not.	(5 + 5)
4	**a)** Describe the working of the energy source in an Electric vehicle with a schematic diagram. **b)** As a team leader of a group involved in designing a new energy device that is environmentally friendly, how do you design a device using gaseous fuels? Explain the construction and working principle.	(5 + 5)
5	Can Cyanidine extracted from grapes be the source for making solar cells? Explain with a neat diagram its working principle and construction of the cell.	10

Time in minutes	0	10	20	30	40	50
Vol. of NaOH (mL)	27.3	27.8	28.3	28.5	29.1	29.5