

**VIT**Vellore Institute of Technology
(Deemed to be University under Section 3 of U.T.E. Act, 1987)**SCHOOL OF ADVANCED SCIENCES****Department of Chemistry****Winter Semester 2023-24****Continuous Assessment Test - II****Course Code:** BCHY101L**Duration:** 90 Minutes**Slot:** E1 + TE1**Course Name:** Engineering Chemistry**Max. Marks:** 50**Class Number:** VI2023240502637; VI2023240502638; VI2023240502640;
VI2023240502641; VI2023240502646; VI2023240502649**Faculty Name:** Dr. Buvanewari G; Dr. Nawaz Khan F; Dr. Rajagopal D; Dr. Sasikumar S;
Dr. Napoleon A.A; Dr. Madhvesh Pathak**Note:** Students are allowed to carry self-hand written note book / textbook to the examination.

Q. No.	Answer <u>ALL</u> the questions (5 × 10 = 50 Marks)	Marks	CO	BL
1	Illuminate the significance of <u>activated complex</u> as well as the importance of <u>parameters composing the Arrhenius equation</u> applied in <u>chemical kinetics with suitable equation and model curves</u> . <u>Correlate the activation energy with alteration in speed of reactions using above-said curves.</u>	10	CO2	BL1
2	(a) Compute the change in entropy on evaporation of 72 kg water at 100 °C, if ΔH for the process is 40.668 kJ/mol. (b) Establish the relation between the values of $t_{3/4}$ and $t_{1/2}$ for a first order reaction.	5 5	CO2	BL3
3	(a) "Energy of the universe is constant while entropy of the universe is increasing continuously". Explain the statement with proper justification. (b) Calculate the e.m.f. of the following cell at 25 °C using the Nernst equation: $\text{Cu(s)} / \text{Cu}^{2+} (0.130 \text{ M}) // \text{Ag}^+ (10^{-4} \text{ M}) / \text{Ag(s)}$; where the values of $E^\circ_{\text{Cu}^{2+}/\text{Cu}}$ and $E^\circ_{\text{Ag}^+/\text{Ag}}$ are 0.34 V and 0.80 V, respectively.	5 5	CO2	BL3

4	<p>(a) "Variation in temperature affects the conductivity of semiconductors and conductors in different fashion", validate the statement.</p> <p>(b) Outline an electrochemical energy device that is refueled instead of recharge and it is composed of ceramics.</p>	5	CO3	BL3
5	Elaborate on any 'green cell' which could involve the extract of a few specific natural fruits to transform electromagnetic radiations to glow a typical electric bulb.	10	CO3	BL2
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