VIT
Vellore Institute of Technology

SCHOOL OF ADVANCED SCIENCES
Department of Chemistry
Winter Semester 2022-23
Continuous Assessment Test – II

Course Code: BCHY101L
Course Name: Engineering Chemistry
Duration : 90 Minutes
Slot : B2 + TB2
Max. Marks : 50

Class Numbers: VL2022230504479; VL2022230504481; VL2022230504617; VL2022230504619; VL2022230504622; VL2022230504549; VL2022230504551; VL2022230504553

Faculty Names: Dr.Buvaneswari G; Dr.Mary Saral A; Dr.Sangeetha D; Dr.Madhumitha G; Dr.Akhila Maheswari M; Dr.Asharani I.V; Dr.U. Vijayalakshmi; Dr.Thenmozhi K

Note: Students are allowed to carry their self-hand written note book and one textbook to the examination.

QN	Answer ALL the questions (5 x 10 = 50 Marks)	Marks	CO	BL
1	What is the significance of different thermodynamic functions that have been introduced? Discuss how they are useful in predicting the spontaneous changes?	10	CO2	BL1
2	**(a)** Calculate the increase in entropy when one gram molecular weight of ice melts at 0°C to form water. Latent heat of fusion of ice = 80 cal/gram. Give the values in J/K/mole **(b)** Sketch a reaction energy diagram for exothermic process. Mark the positions of reactants, products and activated complex. Indicate the activation energies of the forward and reverse process and explain how ΔE for the reaction can be calculated from the diagram.	5+5	CO2	BL2
3	**(a)** The catalytic decomposition of hydrogen peroxide is followed by titrating equal volume of samples of the solution with $KMnO_4$ at the calculated time as follows: Time (min): 0, 5, 15, 25 Volume of $KMnO_4$ (cm^3): 37.0, 29.8, 19.6, 12.3 Find rate constant of the reaction assuming that it follows first order kinetics. **(b)** What is the drawback of semiconducting nature of 'Si' in polycrystalline form? Which form of 'Si' is having highest conductivity and how it can be achieved?	5+5	CO2	BL3
4	**(a)** The standard electrode potentials of lead and silver are -0.18V and +0.80V respectively. Write down the cell reaction at the electrodes and calculate EMF of the cell. **(b)** Name a fuel cell which is applicable for the dual purpose of producing energy and water in the space vehicles. Describe the construction and working of fuel cell.	5+5	CO2	BL4
5	An engineer was asked to design the following cell: n-type semiconductor/Electrolyte/Metal Identify the type of cell and explain its function, construction and its advantages.	10	CO2	BL5