Reg. No. | | | | | | | | |

G. VENKATASWAMY NAIDU COLLEGE (AUTONOMOUS), KOVILPATTI – 628 502.

UG DEGREE END SEMESTER EXAMINATIONS - NOVEMBER 2024.
(For those admitted in June 2021 and later)

PROGRAMME AND BRANCH: B.Sc., CHEMISTRY

SEM	CATEGORY	COMPONENT	COURSE CODE	COURSE TITLE
V	PART-III	CORE	U21CH510	PHYSICAL CHEMISTRY -III

Date & Session: 11.11.2024 / FN **Time :3 hours** **Maximum: 75 Marks**

Course Outcome	Bloom's K-level	Q. No.	**SECTION – A (10 X 1 = 10 Marks)** **Answer ALL Questions.**
CO1	K1	1.	Entropy is a measure of _____ of the molecules of the system. a) concentration b) velocity c) Zig-zag motion d) randomness or disorder
CO1	K2	2.	The Clausius Clapeyron equation helps to calculate. a) latent heat of vaporization b) boiling point or freezing point c) vapour pressure at one temperature, if at another temperature is given d) all of the above
CO2	K1	3.	The rate law relates the rate of a chemical reaction to. a) the concentrations of reactants b) the reaction mechanism c) the activation energy d) the temperature
CO2	K2	4.	As temperature increases, the reaction rate _____. a) decrease than increase b) decreases c) increases d) stays the same
CO3	K1	5.	A catalyst. a) does not react b) reacts and is produced in one of the later steps of a reaction c) reacts in an early step and is produced in a later step d) reacts but is not produced
CO3	K2	6.	An example of acid-base catalysis is. a) inversion of cane sugar b) keto-enol tautomerism c) decomposition of nitramide d) all the above
CO4	K1	7.	When a salt is added to a solution of another salt having a common ion, the degree of dissociation, α,. a) increases b) remains the same c) decreases d) none of these
CO4	K2	8.	Molar solubility is the number of _____ of the substance per litre of the solution. a) grams b) kilograms c) g-equivalents d) moles
CO5	K1	9.	Which of these metals will not dissolve in hydrochloric acid under standard conditions? a) zinc b) aluminium c) copper d) magnesium
CO5	K2	10.	The cell constant can be obtained by. a) dividing specific conductance by observed conductance b) dividing observed conductance by specific conductance c) multiplying specific conductance by observed conductance d) multiplying specific conductance by equivalent conductance

Course Outcome	Bloom's K-level	Q. No.	**SECTION – B (5 X 5 = 25 Marks)** **Answer ALL Questions choosing either (a) or (b)**
CO1	K3	11a.	Explain the term fugacity. How is fugacity of a gas determined? **(OR)**
CO1	K3	11b.	Derive the integral Clausius-Clapeyron equation in the form for an ideal gas.
CO2	K3	12a.	The rate of a particular reaction becomes two times when the temperature is increased from 298 K to 308 K. Calculate the energy of activation for the reaction. **(OR)**
CO2	K3	12b.	Examine mathematically the rate constant and $t_{1/2}$ for first order reactions.
CO3	K4	13a.	Investigate the characteristic of catalytic reactions. **(OR)**
CO3	K4	13b.	Differentiate physical and chemical adsorption.
CO4	K4	14a.	Derive Henderson's equation to calculate the pH of a buffer solution. **(OR)**
CO4	K4	14b.	Calculate an expression for dissociation constant of a weak monobasic acid and its degree of dissociation.
CO5	K5	15a.	Discuss the principle of determination of pH of a solution with the help of a glass electrode. **(OR)**
CO5	K5	15b.	Describe the important applications of emf measurements.

Course Outcome	Bloom's K-level	Q. No.	**SECTION – C (5 X 8 = 40 Marks)** **Answer ALL Questions choosing either (a) or (b)**
CO1	K3	16a.	Write any four applications of Clapeyron-Clausius Equation **(OR)**
CO1	K3	16b.	Derive Van't Hoff Isochore equation
CO2	K4	17a.	Examine briefly the collision theory of reaction rates. What are its limitations and how far they are overcome by theory of absoulte reaction rates? **(OR)**
CO2	K4	17b.	Analyze the various factors affecting rate of chemical reaction
CO3	K4	18a.	Examine Michaelis and Menten's enzyme mechanism in detail to express the rate of reaction. **(OR)**
CO3	K4	18b.	Derive Langmuir adsorption isotherm.
CO4	K5	19a.	Define the terms 'Solubility' and 'Solubility product'. Explain the use of solubility product in qualitative analysis. **(OR)**
CO4	K5	19b.	State Ostwald's dilution law. How is it experimentally verified?
CO5	K5	20a.	Give one example each of electrolytic concentration cells with and without transference. Also write the cell reactions and expressions for the emf of these cells. **(OR)**
CO5	K5	20b.	Discuss the different types of potentiometric titrations.