Register Number:……..

B.E/B.TECH DEGREE EXAMINATIONS: NOV/DEC 2024

(Regulation 2018)

Second Semester

COMMON TO AERO, BIO, EEE, EIE, FT, TXT

U18CHI2202**:** Engineering Chemistry

COURSE OUTCOMES

CO1: Apply the basic principles of chemistry at the atomic and molecular level
CO2: Analyze the impact of engineering solutions from the point of view of chemical principles
CO3: Apply the chemical properties to categorize the engineering materials and their uses
CO4: Integrate the chemical principles in the projects undertaken in the field of engineering and technology
CO5: Develop analytical proficiency through lab skill sets to demonstrate in professional practice

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

1.	"Dilute HCl cannot be stored in Zinc containers", Explain.	CO2	[K_2]
2.	How the microorganisms present in the environment accelerate corrosion processes?	CO4	[K_3]
3.	List the various factors influences the corrosion processes.	CO2	[K_1]
4.	What role does adsorption play in controlling air pollution in urban environments?	CO4	[K_3]
5.	Outline the real-world applications of PVC.	CO3	[K_2]
6.	Recall the term degree of polymerization.	CO3	[K_1]
7.	Label the types of composites with suitable example.	CO3	[K_1]
8.	Differentiate the Intermolecular molecular H-bonding with Intra molecular H-bonding of molecules.	CO1	[K_2]
9.	Interpret the Second law of thermodynamics in monitoring the efficiency of heat engine.	CO4	[K_2]
10.	Relate the Calgon conditioning process in softening of hard water?	CO4	[K_2]

Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

11.	In a concentration cell, one half-cell has a significantly lower concentration of ions than the other. Develop the Nernst equation to calculate the electrode	16	CO1	[K_3]

potential difference and mention its applications.

12.	a)	Illustrate the Langmuir adsorption isotherms in an adsorption process on solid surface with schematic diagram.	10	CO2	[K_2]
	b)	Explain the role of promoters and poisoning in the catalytic processes with example.	6	CO3	[K_2]
13.	a)	A researcher is developing flexible electronic circuits and is considering polyacetylene due to its inherent conductivity. However, the natural conductivity of polyacetylene is insufficient for the intended application. Analyze the suitable doping method that can be applied to increase the conductivity of polyacetylene and explain its mechanism.	8	CO3	[K_4]
	b)	Examine the properties of lubricants used in automotive machines.	8	CO3	[K_4]
14.	a)	Discuss the various types of Vander walls forces of attraction in the molecules.	8	CO1	[K_1]
	b)	Describe the type of hybridization in carbon atoms and the bonding within the methane molecule.	8	CO1	[K_2]
15.		Construct Maxwell's relations to resolve the complex thermodynamic relations involving entropy, volume, pressure, and temperature.	16	CO2	[K_3]
16.	a)	A steam boiler is facing severe scaling and sludging problems, leading to decreased efficiency. Explain how the hardness of water contributes to scaling and sludging in boilers and suggest methods to prevent it.	8	CO4	[K_4]
	b)	Discover the Ion exchange demineralization process used in the softening hard water.	8	CO4	[K_4]

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