Register Number:……..

KUMARAGURU
college of technology
character is life

B.E/B.TECH DEGREE EXAMINATIONS: APRIL / MAY 2023

(Regulation 2018)

Second Semester

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

U18CHI2201**:** 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 field of engineering and Technology.

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

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

1.	Define enthalpy of adsorption.	CO1	[K_1]
2.	Compare and contrast ionic bonds and covalent bonds, discussing their differences in terms of electron sharing and the resulting bond strength.	CO1	[K_2]
3.	Relate work done (W), heat energy (Q) and derive the expression for first law of thermodynamics.	CO2	[K_2]
4.	State third law of thermodynamics.	CO4	[K_1]
5.	Distinguish chemical and electrochemical corrosion.	CO4	[K_2]
6.	Construct a cell by using zinc and copper as half cells and write its representation	CO4	[K_3]
7.	Summarize the adverse impact of using hardwater in boilers.	CO2	[K_2]
8.	Interpret the conditions under which solid lubricants can be used.	CO3	[K_2]
9.	List the polymers which can be remoulded into some other shapes on heating.	CO3	[K_1]
10.	Illustrate the function of auto-catalyst with a suitable example.	CO2	[K_2]

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

11.	a)	Illustrate the short-lived weak force of interaction exists between different type of polar and non-polar molecules with suitable examples.	8	CO1	[K_2]
	b)	Apply the hybridization concept to explain the linear structure of acetylene molecule.	8	CO1	[K_3]
12.	a)	Derive an equation used to estimate the heat of phase transition from the vapor pressures measured at two temperatures.	8	CO4	[K_2]
	b)	Relate the different thermodynamic processes that take place in a system with its surroundings.	8	CO4	[K_2]
13.	a)	Derive an expression to find out the oxidation potential of an unknown cell.	8	CO2	[K_2]
	b)	Apply the principle of cathodic protection to protect underground water pipeline from corrosion.	8	CO2	[K_3]
14.	a)	A boiler produces high-velocity steam that is used in a power plant. Due to the high salt content present in the water, the boiler faced severe corrosion. Select the internal conditioners to be used and explain how they can remove hardness present in the water.	8	CO2	[K_4]
	b)	Explain the preparation, properties, and applications of the following polymers: i) PVC ii) PET	8	CO3	[K_2]
15.	a)	Examine the essential properties that measure the quality of a good lubricating oil.	8	CO3	[K_4]
	b)	Explain the properties and uses of metal matrix composites.	8	CO3	[K_2]
16.	a)	Derive an adsorption isotherm equation by stating the key assumptions made by Langmuir.	8	CO4	[K_2]
	b)	Distinguish between physisorption and chemisorption.	8	CO1	[K_4]

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