R22 Regulation *Subject code: 4B2AI*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech II Semester Supplementary Examinations, January2024

Engineering chemistry

(Common to ECE & IT)

Maximum Marks: 60 Date:29.01.2024 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 10 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

		All the following questions carry equal marks (10x1M=10 Marks)	CO	Bloom Tx
1.	a	Draw the molecular orbital diagram of N_2	CO1	L1
	b	Explain about LCAO method	CO1	L1
	c	What is meant by caustic embrittlement	CO2	L1
	d	What is meant by phosphate conditioning	CO2	L1
	e	Define Galvanic corrosion	CO3	L1
	f	Write the differences between primary and secondary batteries	CO3	L1
	g	Write Dulong's formula of HCV & LCV	CO4	L1
	h	Define calorific value of fuel and write its units	CO4	L1
	i	What are elastomers?	CO5	L1
	j	What is meant by vulcanization process?	CO5	L1

Part-B

	Answer All the following questions. (5X10M=50Marks)		
2	a) Differentiate between atomic orbitals & molecular orbitals. [5M] b) Draw molecular orbital diagram of O_2 or F_2 with magnetic behavior and bond order. [5M]	CO1	L2 L2
	OR		
3	a) Draw the molecular orbital diagram of Benzene. [5M] b) Explain the band structure and effect of doping in solids. [5M]	CO1	L2 L2
4	a) Discuss the ion-exchange process for softening of water. [5M] b) A water sample from an industry had the following data: Mg(HCO3)2=16.8mg/l, MgCl2=19mg/l, MgSO4=24mg/l, CaCl2=11.1mg/l, CaCO3=20mg/l and KOH=2mg/l. Calculate temporary, permanent, and total hardness of water sample. [5M]	CO2	L3 L3
	OR		
5	a) Explain about the internal treatment of Boiler feed water. [5M] b) Explain briefly about reverse osmosis. [5M]	CO2	L2 L3

6	Write the construction & working principle of Zinc-air battery. [10M]	CO3	L3
	OR		
7	Describe about solar cells and write its applications. [10M]	CO3	L3
8	a) Describe about the ultimate analysis of coal and their significance. [5M] b) Differentiate between thermoplastic and thermosetting plastics. [5M]	CO4	L2 L3
	OR		
9	a) Explain about the refining of petroleum with a neat labelled diagram. [5M] b) Discuss about Fischer-Tropsch's process for synthetic petrol. [5M]	CO4	L2 L3
10	a) Write the preparation, properties and applications of PVC. [5M] b) Differentiate between addition and condensation polymerization. [5M]	CO5	L3 L4
	OR		
11	a) Write the preparation, properties and applications of Buna-S & butyl rubber. [5M] b) Explain the mechanism of conducting polymers with an example of trans-polyacetylene. [5M]	CO5	L2 L3