R22 Regulation *Subject code: 4B2AI*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech II Semester Regular/Supplementary Examinations, June 2024

Engineering Chemistry

(Common to ECE & IT)

Maximum Marks: 60 Date:02.07.2024 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	Calculate the bond order in HF molecule.	CO1	3
	b	Define Atomic and Molecular orbitals.	CO1	1
	c	Define Sludges and Scales.	CO2	1
	d	List the units of Hardness of water.	CO2	1
	e	Differentiate between primary and secondary batteries.	CO3	2
	f	List the causes of Corrosion.	CO3	1
	g	Express the Dulong's formula for the calculation of calorific value.	CO5	2
	h	List any four characteristics of a good fuel.	CO5	2
	I	Name the Monomers in Nylon 6,6 formation.	CO4	1
	J	Differentiate between Thermoplastics and Thermoset plastic.	CO4	2

Part-B

Answer All the following questions. **(5X10M=50 Marks)**				
2	a)	Construct the Molecular Orbital Energy Level diagram of O_2 molecule. (5M)	CO1	4
	b)	Explain the Band Theory of solids? Write a note on effect of doping on conductance. (5M)	CO1	4
		OR		
3	a)	What are the Postulates of Molecular Orbital theory. (5M)	CO1	1
	b)	Construct the Molecular Orbital level diagram of 1,3 Butadiene. (5M)	CO1	4
4	a)	Differentiate between Temporary and Permanent Hardness of H_2O. (2M)	CO2	2
	b)	Describe the estimation of H_2O by EDTA Method. (8M)	CO2	2
		OR		
5	a)	Calculate the Temporary and Permanent hardness of a sample of H_20 containing $Mg(HCO_3)_2$ = 7.3 mg/l, $Ca(HCO_3)_2$=16.2 mg/l, $MgCl_2$ = 9.5 Mg/l, $CaSO_4$ = 13.6 mg/l. (5M)	CO2	3
	b)	Explain the desalination of H_20 by Reverse Osmosis method. (5M)	CO2	4

6	a) Explain the Construction, Working and Application of Zn-air battery. (5M) b) Discuss the Mechanism of Electro Chemical Corrosion. (5M)	CO3 CO3	4 2
	OR		
7	Explain the Construction & Working of Methanol – Oxygen fuel cell. (10M)	CO3	4
8	a) Define Cracking. Illustrate the Catalytic Cracking by Moving bed Method. (6M) b) List the gaseous fuels. Give their composition and uses. (4M)	CO5 CO5	3 1
	OR		
9	a) Explain how Octane & Cetane numbers are used to rate the fuel. (4M) b) Explain the Proximate method used to analyze the coal. (6M)	CO5 CO5	4 4
10	a) Explain the preparation properties and applications of Bakelite rubber, PVC. (6M) b) Explain the Free Radical Chain Polymerization Mechanism. (4M)	CO4 CO4	4 4
	OR		
11	a) Define Elastomers and explain the process of Vulcanization. (5M) b) Write the differences between Thermoseting and Thermoplastic resins. (5M)	CO4 CO4	4 4