Course Code: 2020008 Roll No: **MLRS-R20**

MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section2(f) & 12(B)of the UGC act,1956

I B.Tech II Sem Regular/Supply End Examination, September-2022

Engineering Chemistry

(CE, CSC, CSD, ECE, MECH)

Time: 3 Hours. **Max. Marks: 70**

Note: 1. Question paper consists: Part-A and Part-B.
2. In Part – A, answer all questions which carries 20 marks.
3. In Part – B, answer any one question from each unit.
Each question carries 10 marks and may have a, b as sub questions.

PART- A

(10*2 Marks = 20 Marks)

1.	a)	What are the conditions for combination of atomic orbital's to form molecular orbitals?	2M	CO1	BL2
	b)	What is LCAO?	2M	CO1	BL1
	c)	How many grams of MgSO4 dissolved per litre gives 122 ppm hardness.	2M	CO2	BL3
	d)	Discuss internal treatment of water using calgon conditioning.	2M	CO2	BL2
	e)	How electrode potential develop on metal? Define oxidation and reduction potential.	2M	CO3	BL4
	f)	What is passivity of metal?	2M	CO3	BL3
	g)	Write the structure of 2,3-dibromo butane and assign R and S configuration	2M	CO4	BL3
	h)	Explain Markownikoff's rule with suitable example.	2M	CO4	BL2
	i)	Enlist different regions of electromagnetic spectrum.	2M	CO5	BL2
	j)	Discuss affect of hydrogen bonding on the chemical shift.	2M	CO5	BL4

PART- B

(10*5 Marks = 50 Marks)

2	a)	Draw the molecular orbital energy level diagram of N2, O2 and explain their magnetic nature and bond order.	5M	CO1	BL2
	b)	Discuss the pi-molecular orbital theory of 1,3-butadiene.	5M	CO1	BL3
		OR			
3		What are the salient features of crystal field splitting theory?	10M	CO1	BL2
4	a)	Discuss the ion exchange process for water softening.	5M	CO2	BL2
	b)	Describe the principle of EDTA complexometric method.	5M	CO2	BL2
		OR			
5		What are the specifications of potable water and explain steps involved in its treatment?	10M	CO2	BL3

6	a)	Write the construction and working of Lithium cell.	5M	CO3	BL4
	b)	What is electrochemical series and explain its applications.	5M	CO3	BL3
		OR			
7		What is electrochemical corrosion? Explain the electrochemical corrosion of hydrogen evaluation and oxygen absorption mechanism.	10M	CO3	BL3
8	a)	Write the structure, synthesis and pharmaceutical applications of Paracetamol.	5M	CO4	BL4
	b)	Explain the mechanism of oxidation of alcohols using KMnO4.	5M	CO4	BL5
		OR			
9		What are nucleophilic substitution reactions? Explain mechanism and stereo chemistry of S N 1 reactions.	10M	CO4	BL6
10	a)	Describe the principle of NMR spectroscopy.	5M	CO5	BL3
	b)	Discuss the applications of IR spectroscopy.	5M	CO5	BL3
		OR			
11		What is the principle of electronic spectroscopy and explain different types of electronic transitions occurs in a molecule?	10M	CO5	BL4

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CO: Course Outcome **BL: Blooms Taxonomy Levels**