



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 Section 2(f) & 12(B) of the UGC act, 1956

I B.Tech I Sem Regular/Supply End Examination, April 2022

Engineering Chemistry

(EEE, CSE, IT, CSI, CSM)

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) | How band theory explain the behaviour of conductors, semiconductors and insulators. | 2M | C01 | BL1 |
| b) | Discuss the differences between bonding and anti bonding molecular orbitals. | 2M | C01 | BL2 |
| c) | Define foaming and explain causes and preventions methods of it. | 2M | C02 | BL1 |
| d) | What is Disinfection of water? Explain chlorination? | 2M | C02 | BL2 |
| e) | Define standard electrode potential? Give its importance. | 2M | C03 | BL1 |
| f) | How corrosion can be protected by proper designing of metal articles? | 2M | C03 | BL1 |
| g) | What are the difference between enantiomers and diastomers. | 2M | C04 | BL1 |
| h) | Write sawhorse and Fischer projections of butan-2-ol. | 2M | C04 | BL1 |
| i) | Define the terms frequency and wavelength. | 2M | C05 | BL1 |
| j) | What is the importance of finger print region in IR spectroscopy? | 2M | C05 | BL1 |

PART- B

(10*5 Marks = 50 Marks)

- | | | | | |
|-------|---|-----|-----|-----|
| 2. a) | Draw the π molecular orbitals of 1,3-butadiene. | 5M | C01 | BL1 |
| b) | Write the postulates of Molecular Orbital theory? | 5M | C01 | BL1 |
| OR | | | | |
| 3. | Write the crystal field splitting patter of d-orbitals in tetrahedral and octahedral complexes. Describe how crystal field theory useful to explain the colour in metal complexes? | 10M | C01 | BL2 |
| 4. a) | Calculate temporary, permanent and total hardness of a sample of water containing: $Mg(HCO_3)_2 = 14.6$ mg/L, $CaCl_2 = 22.2$ mg/L, $CaCO_3 = 200$ mg/L, $SiO_2 = 150$ mg/L, $Na_2SO_4 = 184$ mg/L in ppm and mg/L. | 5M | C02 | BL3 |
| b) | What is Caustic embrittlement? Explain its causes and prevention methods. | 5M | C02 | BL4 |

OR

5 Discuss EDTA complexometric method for determination of hardness of water. 10M C02 BL2

6 a) Write the construction and working of Lithium cell. 5M C03 BL1

b) What is dry corrosion? Explain its mechanism. 5M C03 BL1

OR

7 Explain the construction, working of glass electrode and discuss the determination of pH of unknown solution using glass electrode. 10M C03 BL4

8 a) Explain reduction of carbonyl compounds using LiAlH_4 . 5M C04 BL4

b) Discuss sequence rules for absolute configuration with suitable examples. 5M C04 BL2

OR

9 What are nucleophilic substitution reactions? Explain mechanism and stereo chemistry of $\text{S}_\text{N}2$ reactions. 10M C04 BL4

10 a) Discuss the principle of IR spectroscopy. 5M C05 BL2

b) Explain different types of electronic excitations occur in a molecule? 5M C05 BL4

OR

11 Explain shielding and deshielding of protons in ^1H NMR spectroscopy with examples. 10M C05 BL4

---oo0oo---