R18 Regulation *Subject code:2B1AG*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech I Semester Supplementary Examinations, January 2026

ENGINEERING CHEMISTRY

(Common to ECE & CSE)

Maximum Marks: 70 Date:09.01.2026 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 20 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 (10X2M=20 Marks)		Marks	CO	BTL
1	What is the bond order of O_2 molecule?	2M	1	L1
2	Differentiate molecular orbital from atomic orbital?	2M	1	L1
3	How can we remove temporary hardness? Give its equation?	2M	2	L1
4	Explain about calgon conditioning of water. What is meant by desalination of Brackish water?	2M	2	L1
5	Define single electrode potential and EMF of the cell.	2M	3	L1
6	What are the causes of corrosion?	2M	3	L1
7	Define optical activity with one example?	2M	4	L1
8	Define Markownikoff rule?	2M	4	L1
9	Write selection rule for UV-Visible spectroscopy?	2M	5	L1
10	Define chemical shift?	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	a) Explain bond order and Magnetic properties of F_2 and HF b) Discuss the Cristal Field Splitting in Tetrahedral complexes in detail	5M 5M	1	L2
	OR			
12	a) Write molecular orbital diagrams of 1, 3 butadiene? b) Explain the extrinsic semiconductors.	5M 5M	1	L2
13	a) The amount of temporary and permanent hardness of water sample which contains following impurities $Ca(HCO_3)_2$=16.2 mg/lit, $Mg(HCO_3)_2$=7.3 mg/lit, $CaSO_4$ =204 mg/lit,, $MgCl_2$ =9.5 mg/lit. b) Explain potable water and its treatment?	5M 5M	2	L2
	OR			
14	a) How is the hardness of water, Express what are the units of Hardness explain their inter conversion? b) What is the hardness of water? Explain their Types?	5M 5M	2	L2
15	a) Explain the working of calomel Electrode b) Explain the mechanism of dry corrosion?	5M 5M	3	L2

	OR			
16	Explain the mechanism involved in electrochemical corrosion	10M	3	L2
17	a) Explain in detail about conformational isomerism of n – butane b) Explain about SN^1 and SN^2 mechnisms in substitution reaction by taking Suitable example?	5M 5M	4	L2
	OR			
18	Explain the following rearrangement reactions (i) Pinakol- pinacolone rearrangemen (ii) Wagner- merwin rearrangement	5M 5M	4	L2
19	a) Explain about various electronic transitions in molecule by the absorption of energy? b) Explain about types of vibrations of molecules in IR spectroscopy?	5M 5M	5	L2
	OR			
20	a) Explain the theory of NMR spectroscopy and explain about formation of peaks in NMR spectrum? b) Write a note on chemical shift.	5M 5M	5	L2