



R20 Regulation

Subject code:3B1AG

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech I Semester Supplementary Examinations, July 2025

ENGINEERING CHEMISTRY

(EEE)

Maximum Marks: 70

Date:16.07.2025

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 in 'O ₂ ' molecule?	2M	1	L1
2	Write any two differences between bonding and anti-bonding molecular orbitals?	2M	1	L1
3	How can you remove temporary hardness?	2M	2	L1
4	What is reverse osmosis?	2M	2	L1
5	Define standard electrode potential & Single electrode potential?	2M	3	L1
6	What are the Electrodes used in Li- ion Batteries?	2M	3	L1
7	Define Galvanic corrosion.	2M	4	L1
8	Define wet corrosion.	2M	4	L1
9	What is knocking?	2M	5	L1
10	What is the cetane number of diesel fuel?	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	a) Explain the postulates of Molecular Orbital theory? b) Write the Energy level diagrams of O ₂ ?	5M 5M	1	L2
OR				
12	a) Explain band theory of solids. b) Explain the crystal field splitting in tetrahedral metal complexes.	5M 5M	1	L2
13	What is the principle of EDTA titration? How the permanent hardness of water is determined using EDTA method.	10M	2	L2
OR				
14	a) Explain the reasons for scale and sludge formation and write their disadvantages in boilers. b) Write about phosphate conditioning and Calgon conditioning?	5M 5M	2	L2
15	a) Explain the construction and working of the calomel electrode. b) What is electro chemical series? Write its significance and applications?	5M 5M	3	L2
OR				

16	Explain the construction and working of Lead -acid storage battery and write its applications.	10M	3	L2
17	a) Define corrosion? Explain types of corrosion. b) Explain cathodic protection in corrosion control method.	5M 5M	4	L2
	OR			
18	What is the importance of ultimate analysis of coal?	10M	4	L2
19	a) Explain the characteristics of a good fuel. b) Explain the Proximate analysis in detail. What is the significance.	5M 5M	5	L2
	OR			
20	a) Explain the Bergius process for the production of liquid hydrocarbon. b) Discuss Fischer -Tropsch method for the preparation of synthetic petrol.	5M 5M	5	L2