R20 Regulation *Subject code:3B2AJ*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech II Semester Supplementary Examinations, July 2025

ENGINEERING CHEMISTRY

(ME)

Maximum Marks: 70 Date: 11.07.2025 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 magnetic nature of 'N_2'molecule?	2M	1	L1
2	What is meant by Doping in case of Semiconductors?	2M	1	L1
3	What is meant by Hardness of water?	2M	2	L1
4	What is reverse osmosis?	2M	2	L1
5	Write the applications of Lithium-ion battery?	2M	3	L1
6	What is electro chemical series? Write any two applications?	2M	3	L1
7	Explain the mechanism of pitting corrosion with a suitable illustration.	2M	4	L1
8	Define wet corrosion?	2M	4	L1
9	What is the difference between Gross and net calorific value?	2M	5	L1
10	Define proximate analysis?	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 the salient features of Crystal field theory. b) Explain the crystal field splitting in octahedral 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 treatment of potable water. b) Explain in detail about boiler corrosion.	5M 5M	2	L2
15	a) Derive Nernst equation for the potential of a single electrode? b) Explain glass membrane electrode.	5M 5M	3	L2
	OR			
16	Explain the construction and working of Lead -acid storage battery and	10M	3	L2

	write its applications.			
17	a) Write a note on cathodic protection. b) Explain the factors effecting rate of corrosion.	5M 5M	4	L2
	OR			
18	Explain the mechanism involved in wet corrosion.	10M	4	L2
19	a) What are the characteristics of a Good fuel? b) Discuss Fischer – Tropsch method for the preparation of synthetic petrol.	5M 5M	5	L2
	OR			
20	a) Explain about refining of petroleum by fractional distillation method. b) Write a note on i)LPG ii) CNG	5M 5M	5	L2