R25 Regulation *Subject code:5BS2AN*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech II Semester Regular Examinations, June 2026

ENGINEERING CHEMISTRY

(Common to CSE & CSE(AI&ML))

Maximum Marks: 60 Date:17.06.2026 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 10 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 (5X2M=10Marks)		Marks	CO	BTL
1.a	Define Temporary hardness with examples.	2M	1	L1
b	Write the statement of Nernst equation?	2M	2	L1
c	Define HCV, LCV.	2M	3	L1
d	What is meant by polymerization?	2M	4	L1
e	Define biosensors with examples.	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
2	a) A sample of water is found to contain the following dissolving salts in milligrams per liter $Mg(HCO_3)_2$ = 146 mg, $CaCl_2$ = 222 mg, $Ca(HCO_3)_2$ = 162 mg, $MgSO_4$ = 80 mg, $MgCl_2$ = 190 mg, $CaCO_3$ = 100 mg and NaCl=72 mg. Calculate the Temporary, Permanent and total hardness of water from the given sample. b) Explain about hardness of water by Complexometric (or) EDTA method?	3M 7M	1	L3 L2
	OR			
3	a) Explain the external treatment of Boiler feeding water by Ion-Exchange process b) Discuss Reverse Osmosis Method.	5M 5M	1	L2
4	a) Explain the factors affecting the rate of corrosion b) Describe the construction of Standard Hydrogen electrode (SHE) with neat diagram.	5M 5M	2	L2
	OR			
5	a) Explain the construction and working of the Calomel electrode. b) What is the principle involved in cathodic protection? How can you protect the buried pipelines by impressed current method?	5M 5M	2	L2

6	a) Explain the construction and working of a Lithium-ion battery with reactions taking place during charging and discharging. b) Describe the manufacture of gasoline by Fischer-Tropsch's method.	5M 5M	3	L2
	OR			
7	a) What is Cracking of Petrol? How will you apply moving bed catalytic cracking to refine the petroleum? b) Explain the working principle of methanol-oxygen fuel cell with reactions.	5M 5M	3	L2
8	a) Explain the preparation, property and uses of PVC. b) Discuss the mechanism of condensation polymerization with examples.	5M 5M	4	L2
	OR			
9	a) Explain the properties and applications of Buna-S and Nylon-6,6. b) Write the difference between thermoplastics and thermosetting plastics.	4M 6M	4	L2
10	a) What are lubricants? Explain their uses, thin film lubrication, and the important properties of a good lubricant. b) Write a short note on cloud and pour points.	5M 5M	5	L2
	OR			
11	a) Explain the mechanism of setting and hardening of cement. b) Describe shape memory materials with examples and mention their applications.	5M 5M	5	L2