R22 Regulation *Subject code:4B2AI*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech II Semester Supplementary Examinations, June 2026

ENGINEERING CHEMISTRY

(Common to ECE & IT)

Maximum Marks: 60 Date: 24.06.2026 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 (10X1M=10 Marks)		Marks	CO	BTL
1.a	What is the magnetic nature of 'N_2'molecule?	1M	1	2
b	Define Bond order.	1M	1	1
c	Why the hardness is expressed in CaCO3 equivalents?	1M	2	1
d	Write the calgon formula.	1M	2	1
e	Define Battery?Give example.	1M	3	2
f	What is meant by rusting of iron?	1M	3	2
g	What is meant by calorific value of a fuel?	1M	4	1
h	What is octane number?	1M	4	1
i	Define Elastomers.	1M	5	1
j	Write the reaction for the formation of nylon-6,6 .	1M	5	2

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
2	a) Explain molecular orbital energy level diagram for O_2 molecule. b) Explain the pi-molecular orbital energy level diagram of 1,3-butadiene.	5M 5M	1	1
	OR			
3	Explain in detail about intrinsic and extrinsic semiconductors.	10M	1	1
4	a) How can we estimate the amount of hardness by complexometric method? b) Calculate the temporary and permanent hardness of given Water containing following impurities per liter. $MgCl_2$ = 9.5mgs, $MgSO_4$=60mgs, $CaSO_4$= 11.1mgs, $Ca(HCO_3)_2$=16.2mgs, $Mg(HCO_3)_2$=7.3mgs.	7M 3M	2	3 3
	OR			
5	Illustrate the steps involved in the treatment of Potable water.	10M	2	1
6	Explain the mechanism of formation of rust by Evolution of Hydrogen and Absorption of Oxygen (wet corrosion).	10M	3	2
	OR			
7	a) What are Secondary Batteries? Explain their working with Suitable example.	5M	3	2

	b) Explain fuel cells and mention their applications?	5M		
8	a) What is cracking? How is gasoline obtained by moving bed catalytic cracking? b) Write a short note each on CNG and LPG.	5M 5M	4	2 2
	OR			
9	How is coal analyzed by proximate analysis? Give its significance.	10M	4	2
10	a) Write the preparation, properties, and applications of PVC. b) Write preparation, properties, and engineering applications of Buna-S rubber.	5M 5M	5	2
	OR			
11	Explain the mechanism of free radical chain polymerization.	10M	5	2