R20 Regulation *Subject code:3B1AN*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech I Semester Supplementary Examinations, July 2025

CHEMISTRY

(Common to CSE, CSE(AI&ML), CSE(DS) & IT)

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 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	Write the boiling reactions in the removal of temporary hardness?	2M	2	L1
5	How do you differentiate a Cell from Battery?	2M	3	L1
6	Define Cell potential (EMF).	2M	3	L1
7	What is Sayetzeff rule?	2M	4	L1
8	What is meant by chirality?	2M	4	L1
9	What is the principle involved IR spectroscopy?	2M	5	L1
10	Write any two applications of UV spectroscopy?	2M	5	L1
	Part-B			
Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	a) Explain molecular orbital diagram for O_2 & N_2. b) Explain the postulates of Molecular Orbital theory.	5M 5M	1	L2
	OR			
12	a) Explain the salient features of Crystal field theory. b) Explain the crystal field splitting in tetrahedral metal complexes.	5M 5M	1	L2
13	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.	5M 5M	2	L2
	OR			
14	a) What is meant by desalination of water? Explain reverse osmosis? b) What are scales and sludges? Write their disadvantages in Boilers?	5M 5M	2	L2
15	a) Explain the construction and working of the Glass electrode and how can we determine the pH Of unknown solution by using glass electrode. b) Derive Nernst equation.	5M 5M	3	L2

	OR			
16	a) What are Secondary Batteries? Explain their working with Suitable example? b) Explain are fuel cells? Mention their applications.	5M 5M	3	L2
17	a) Explain the conformational analysis of n-butane. b) Write a note on symmetry?	5M 5M	4	L2
	OR			
18	a) Explain the SN^1 and SN^2 mechanism with suitable example. b) Explain the hydroboration of olefins.	5M 5M	4	L2
19	a) Write a note on chemical shift? b) Explain the basic principle of NMR.	5M 5M	5	L2
	OR			
20	a) What is MRI? b) Write the application IR spectroscopy	5M 5M	5	L2