R20 Regulation *Subject code:* 3B1AN

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech I Semester Regular Examinations, July 2021

Chemistry

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

Maximum Marks: 70 Date:16.07.2021 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)

1 Why anti bonding orbitals have high energy the atomic orbitals?
2 Calculate CFSE of $[Cr(NH_3)_6]^{3+}$ complex.
3 Convert 10 ppm into mg/L and degree French.
4 Write specifications of potable water
5 State Nernst equation.
6 How do you distinguish primary and secondary batteries.
7 Write the conditions for a compound to become chiral.
8 Mention applications of paracetamol
9 What is fingerprint region? Mention its importance.
10 What are the transitions possible in UV visible spectoscopic?

Part-B

Answer All the following questions. **(5X10M=50Marks)**

11 a) Mention the postulates of Molecular orbital theory. (5M)
b) Draw the molecular orbital energy level diagram of F2 and calculate bond order. (5M)

OR

12 Explain the crystal field splitting in tetrahedral complex $[CO(NH_3)_6]^{3+}$, with neat diagram. (10M)

13 a) Discuss about the EDTA method for the estimation of hardness of water. (5M)
b) Compare Colloidal Conditioning and Calgon Conditioning. (5M)

OR

14 a) A sample of hard water contains 150 ppm of temporary hardness and 300 ppm of permanent hardness. Express the above hardness in degree Clarke & degree French. (5M)
b) Explain Ion- exchange process with a neat labeled diagram. (5M)

15 a) How do you determine the pH of a solution by making use of glass electrode? (5M)

b) Explain the composition, applications and advantages of the Lead acid cell. (5M)

OR

16 a) Construct calomel cell and discuss determination of pH of a solution by use of this cell. (5M)

b) What is fuel cell? Describe function of Hydrogen – Oxygen fuel cell. (5M)

17 a) Differentiate SN1 and SN2 reactions. (5M)

b) Discuss stability of conformational isomers of n-butane. (5M)

OR

18 a) Discus about Elimination (E1) reaction mechanism. (5M)

b) Write three reactions of oxidation using chromic acid. (5M)

19 a) Define chemical shift and explain how it is used to interpret NMR spectra. (5M)

b) Discuss the principle of IR spectroscopy. (5M)

OR

20 a) Discuss the selection rules and types of electronic transitions for electronic spectra of molecules. (5M)

b) Describe the types of stretching and bending vibrations with suitable examples. (5M)