R18 Regulation *Subject code:2B1AG*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech I Semester Supplementary Examinations, March/April 2023

Engineering Chemistry

(Common to ECE & CSE)

Maximum Marks: 70 Date:10.04.2023 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 Energy level diagram of O_2.
2 Crystal field splitting in tetrahedral complexes.
3 Write notes on scale and sludges?
4 What is hardness? Give the causes of hardness of water with examples.
5 What is an electrochemical cell?
6 Derive Nernst equation.
7 Write the structural isomerism with examples.
8 Write about chirality?
9 Write any two examples of IR active compounds?
10 Write any three applications of UV spectroscopy.

Part-B

Answer All the following questions. (10M X 5=50Marks)

11 a) Explain the salient features of MOT theory. [5]

b) Explain bond order and magnetic properties of (i) N_2 (ii) F_2 molecules with neat energy level diagrams. [5]

OR

12 Write a short notes on i) n-Type Semiconductor ii) p-Type Semiconductor. [5+5]

13 a) Define hardness of water? How can we remove hardness of water by using ion exchange process. [5]

b) A sample of water contains Mg^{2+} = 18 Mg/L, Ca^{2+} = 30 Mg/L, Co_2 = 11 Mg/L HCo_3 = 122 Mg/ L, then calculate temporary & permanent hardness of water In Degree Clarke & Degree French. [5]

OR

14 a) What is hardness of water? How hard water estimated by EDTA method? [5]

b) Explain about reverse Osmosis. [5]

15 a) Explain the standard electrode potential by taking calomel electrode as an example. [5]
b) Explain charging and discharging of lead acid storage cell with chemical reactions. [5]

OR

16 a) What is electrochemical series? Give its applications. [5]
b) Write the factors affecting rate of corrosion. [5]

17 a) What is Grignard reagent & explain about Grignard addition on carbonyl compounds. [5]
b) Explain about synthesis and applications of paracetamol & Aspirin. [5]

OR

18 a) Write notes on Enantiomers and diastereomers. [5]
b) Explain reduction of carbonyl compounds using $LiAlH_4$ and $NaBH_4$ with examples. [5]

19 Explain the principle and working of IR spectroscopy. [10]

OR

20 a) Write a note on vibrational and rotational spectroscopy. [5]
b) Write a note on Chemical Shift? [5]