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TEEGALA KRISHNA REDDY ENGINEERING COLLEGE
(UGC – AUTONOMOUS)
B TECH I Semester Examinations, July 2021
(Common to EEE, CSE, IT)

CHEMISTRY
Answer any Five questions
All questions carry equal marks

Time : 3 Hours   Max. Marks : 75

1. a) Enumerate the salient features of Crystal Field Theory

   b) Explain Crystal field splitting of transition metal ion d-orbitals in Octahedral and Square planar complexes.   (7+8)

2. a) Demonstrate the bonding and magnetic properties of O_2 and F_2 molecules using molecular orbital theory.

   b) Define Atomic and molecular orbitals? Explain the linear combination of atomic orbitals into molecular orbitals.   (8+7)

3. a) Explain the difference between temporary hardness and permanent hardness. Give the specifications of portable water.

   b) Enumerate the steps involved in the treatment of industrial wastewater using Calgon conditioning.   (8+7)

4. a) Explain the desalination of water by reverse osmosis method What is the meaning of Phosphate conditioning?

   b) 150ml of a sample water consumed 35ml of 0.02M EDTA before boiling and 5ml of the same EDTA after boiling. Calculate the degree of hardness, permanent hardness, and temporary hardness.   (8+7)

5. a) Derive the Nernst equation to calculate the pH of the solution using quinhydrone electrode.

   b) Briefly explain the features of electrochemical series and advantages to decide the electrode materials to get maximum cell potential. Calculate the cell potential of the cell constituting 0.15M $CuSO_4$ and 0.24M $ZnSO_4$.   (5+10)

6. a) Explain the construction and working of Li-ion battery and mention their applications.

   b) Briefly explain the cathodic protection methods taking an example to each.   (8+7)

7. a) Mention the difference between configuration and conformations of organic compound. Define enantiomers, optical activity with an example.

   b) Explain the mechanism of S_N2 reaction with example. Give the difference between Markownikoff and anti-Markownikoff's additions with example.   (7+8)

8.a)Explain the basic principle involved in Nuclear Magnetic Resonance Spectroscopy. Define Chemical shift?

   b) Explain the synthesis and pharmaceutical applications of Aspirin.   (7+8)

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