



## I B.Tech II Sem Regular Examination, October/November 2020

**CHEMISTRY**  
**(CIVIL, MECH, ECE)**
**Time: 2 Hours.****Max. Marks: 70**

Note: 1. Answer any FIVE questions.

2. Each question carries 14 marks and may have a, b as sub questions.

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|---|---|-----|
| 1 | a) Draw molecular energy level diagram for oxygen molecule. Calculate bond order and write its magnetic behavior.   | 7M  |
|   | b) What are the salient features of crystal field theory? Explain crystal field splitting of 'd' orbital in octahedral field.   | 7M  |
| 2 | Differentiate atomic and molecular orbitals. How does doping effects conductance? Explain pi molecular orbitals of butadiene with the help of diagram.                                      | 14M |
| 3 | a) What is disinfection of water? How does chlorination and ozonisation helps in the disinfection of water?   | 7M  |
|   | b) Give various units to express hardness of water. How are they related? What are the methods for the removal of temporary and permanent hardness causing salts from water                 | 7M  |
| 4 | Write Nernst equation for the following cell.<br>$Zn / Zn^{+2} // H^+ / H_2, Pt. (0.01M) (0.1M)$<br>How do you determine pH of a solution using glass electrode and quinhydrone electrodes. | 14M |
| 5 | a) What is the necessity for internal conditioning of boiler water? Describe calgon and colloidal conditioning methods  | 7M  |
|   | b) Describe the construction and working of Lead acid storage battery. What are its uses?   | 7M  |
| 6 | Differentiate enantiomers and diastereomers. Discuss about conformational analysis of n - butane .  | 14M |
| 7 | a) By taking propene as an example , how does HBr adds to it. What is the rule involved in this addition. Explain.  | 7M  |
|   | b) What are the selection rules involved in UV - Visible spectroscopy. Give any three applications.   | 7M  |
| 8 | What is vibrational - rotational spectroscopy? Give selection rules in IR spectroscopy. How do you identify -OH, -NH, >C= O groups in an organic compound ?                                 | 14M |