

Code No: 152AB

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B.Tech I Year II Semester Examinations, September/October - 2021****CHEMISTRY****(Common to CE, ME, ECE, EIE, MCT, MMT, ECM, AE, MIE, CSBS, CSE(AI&ML),  
CSE(IOT))****Time: 3 Hours****Max. Marks: 75****Answer any five questions  
All questions carry equal marks**

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- 1.a) Explain the postulates of molecular orbital theory.  
b) With the help of molecular orbital energy level diagram, calculate bond order and predict magnetic behavior of  $N_2$ . [6+9]
- 2.a) Discuss the crystal field splitting of d-orbitals in tetrahedral geometry.  
b) Explain the effect of doping on the conductance of the solids. [7+8]
- 3.a) Give an account on ion-exchange process. How exhausted resins are regenerated?  
b) What do you understand by desalination of water? Explain about the reverse osmosis. [7+8]
- 4.a) Define Hardness of water. How would you determine it by complexometric method?  
b) Discuss the disinfection of water by chlorination. [9+6]
- 5.a) What is Electrochemical series? Write the reduction potential values of metals. What are the important applications of electrochemical series?  
b) What is meant by reference electrode? Construct calomel electrode and write its half cell reaction. [9+6]
- 6.a) Differentiate between Galvanizing and tinning. How these procedures can protect the metals from corrosion.  
b) Explain the theory of chemical corrosion. [9+6]
- 7.a) Discuss the mechanism of Nucleophilic substitutions reactions-  $S_N1$  and  $S_N2$  reactions.  
b) What are Enantiomers? Give examples. [11+4]
- 8.a) What are the various modes of electronic transitions observed, when a molecule is irradiated with UV-Visible light.  
b) What is chemical shift value in NMR spectroscopy? Explain shielding and deshielding effect in NMR spectroscopy. [9+6]

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