

Code No: 151AF

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B.Tech I Year I Semester Examinations, December – 2019/January - 2020****CHEMISTRY****(Common to EEE, CSE, IT, ITE)****Time: 3 hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A**(25 Marks)**

- 1.a) What are atomic and molecular orbitals? [2]
- b) Define temporary and permanent hardness of water? How is it caused? [2]
- c) Define single electrode potential. [2]
- d) Define optical activity. Give example of optically active compounds. [2]
- e) Explain the terms transmittance and absorbance. [2]
- f) Explain insulators on the basis of band theory. [3]
- g) Outline the specifications of potable water. [3]
- h) Explain sacrificial anodic protection technique for prevention of corrosion. [3]
- i) Explain electrophilic addition reaction with an example. [3]
- j) How do you identify carbonyl compounds amines using IR spectroscopy? [3]

PART – B**(50 Marks)**

- 2.a) Explain the molecular orbital energy level diagram of N_2 molecules.
 - b) Explain the π molecular orbitals of butadiene. [5+5]
- OR**
3. Discuss the crystal field splitting of d orbitals in octahedral and tetrahedral fields. [10]
- 4.a) Explain a method for desalination of brackish water.
 - b) Explain calgon and phosphate conditioning. [5+5]
- OR**
- 5.a) Discuss complexometric method for estimation of hard water.
 - b) Explain disinfection of water by chlorination. [5+5]
- 6.a) Write the construction and working of calomel electrode.
 - b) Explain electrochemical theory of corrosion by taking rusting of iron as an example. [5+5]
- OR**
- 7.a) Explain the principle and working of lead acid storage battery.
 - b) Explain galvanic and pitting corrosion. [5+5]

- 8.a) Explain the mechanism for the reduction of carbonyl compounds to alcohols using LiAlH_4 .
b) Differentiate enantiomers and diastereomers. [5+5]
- OR**
- 9.a) Explain Markownikoff's rule with the help of an example.
b) Discuss the mechanism involved in oxidation of alcohols using KMnO_4 . [5+5]
10. Discuss briefly the theory of Nuclear magnetic resonance Spectroscopy. How many signals are expected in a) ethanol b) cyclobutane in nmr spectrum? [10]
- OR**
- 11.a) How uv-visible spectroscopy is used in quantitative analysis?
b) What is the principle of NMR spectroscopy write about MRI? [5+5]

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