

R18

Code No:151AF

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

B.Tech I Year I Semester Examinations, December - 2018

CHEMISTRY

(Common to EEE, CSE, IT)

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, c as sub questions.

PART - A

(25 Marks)

- 1.a) Give the reason for crystal field splitting of d-orbitals. [2]
- b) Why do you express hardness of water in CaCO_3 equivalents. [2]
- c) Salt bridge is not required in Lead-acid storage cell. Explain. [2]
- d) Why Markownikoff's rule fails in the addition of HBr to propene in presence of H_2O_2 . [2]
- e) How many fundamental vibrations are possible in HCN, CH_4 . [2]
- f) Write the energy level diagram for N_2 molecule. [3]
- g) What is Caustic embrittlement? How do you present it? [3]
- h) Why coating of zinc on iron is called sacrificial anode. Explain. [3]
- i) How enantiomers differs from diastereomers. [3]
- j) Give reason why O_{16} , O_{18} , C_{12} do not exhibit NMR spectrum. [3]

PART - B

(50 Marks)

- 2.a) Explain about crystal field theory.
 - b) Mention the difference between atomic and molecular orbitals. [5+5]
- OR**
- 3.a) Give an account of LCAO. [5+5]
 - b) Write notes on molecular orbital theory.
- 4.a) Discuss the ion-exchange process of softening of hard water. How the exhausted resins are regenerated.
 - b) Give the steps involved in the treatment of domestic water [5+5]
- OR**
- 5.a) What is the principle involved in complex metric method in estimation of hardness of water.
 - b) Differentiate between scales and sludge's. [5+5]

6.a) How can you determine the pH of an unknown solution by using quinhydrone Electrode.

b) Iron corrodes faster than aluminum. Explain.

[5+5]

OR

7.a) Write an account of lithium ion batteries.

b) Explain the chemical reactions involved in electrochemical corrosion.

[5+5]

8.a) What are S_N^1 and S_N^2 reactions. Write the mechanism with suitable examples. Give their stereochemistry.

b) Explain different conformations of butane with the potential energy diagram.

[5+5]

OR

9.a) What are elimination reactions? Explain dehydro halogenations of alkyl halides with a suitable examples.

b) What is isomerism? How is it classified? Explain with suitable examples.

[5+5]

10.a) What are various electronic transitions? Give a brief note with suitable examples.

b) Write the basic principle of IR spectroscopy. Give various molecular vibrations in the technique.

[5+5]

OR

11.a) What are the selection rule in IR spectroscopy? Give any two applications of IR Spectroscopy.

b) What is the principle involved in Nuclear magnetic resonance Spectroscopy?

[5+5]