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.
b) Write notes on molecular orbital theory. [5+5]

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]

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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_N1 and S_N2 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]

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