R18

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 diasteromers.   [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   [5+5]

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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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