



ACE
Engineering College
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An AUTONOMOUS Institution

ACE-R20

Question Paper Code:

CH102BS

Supplementary Examination
I B. Tech- I Semester- November 2021
Engineering Chemistry
(Common To EEE,CSE,IT,CSD)

Time: 3 Hours

Max. Marks: 70

H. T. No

Answer any five full questions from the following. All Questions carry equal marks.

M=Marks; CO=Course Outcomes; PO= Program Outcomes

Q.No	Question	M	CO	PO
1. a)	Write the Principles that are followed by the Molecular Orbital Theory and write a short note on Linear Combination of Atomic Orbitals to form molecular orbitals.	7	1	PO1
b)	Explain the bond order and magnetic moment of N ₂ & F ₂ with the help of molecular orbital diagram.	7	1	PO1
2.a)	Discuss the differences between n-type and p-type semiconductors.	6	1	PO2
b)	Draw the crystal field splitting of d-orbitals in tetrahedral and octahedral complexes. Calculate the magnetic moment and bond order.	8	1	PO1
3.a)	Write the procedure involved in treatment of domestic water.	7	2	PO12
b)	A sample of water on analysis contains 4.8mg/L of Mg(HCO ₃) ₂ , 15mg/L of MgSO ₄ , 16.2mg/L of Ca(HCO ₃) ₂ , 20mg/L of CaCl ₂ , and 13.8mg/L of CaSO ₄ . Calculate the temporary, permanent and total hardness of water and express them in degree Clark and degree French.	7	2	PO2
4. a)	Explain temporary and permanent Hardness with suitable examples. Give the specifications of potable water.	8	2	PO12
b)	Write a short note on i. Phosphate conditioning ii. Calgon conditioning	6	2	PO2
5. a)	Define reference electrode and explain the construction and working of calomel electrode	6	3	PO1
b)	What is the principle involved in cathodic protection? Explain the protection of ship hulls from corrosion diagrammatically by sacrificial anodic method	8	3	PO2
6. a)	Explain E and Z isomers with suitable examples.	6	4	PO2
b)	Define the following terms: i) Enantiomers ii) Diastereomers iii) Markonikov's rule iv) Saytzeff's rule	8	4	PO1
7.a)	Explain differences between S _N 1 and S _N 2 reactions with examples.	7	4	PO1
b)	Discuss the stability of n-butane with energy level diagram.	7	4	PO1
8. a)	Write the basic principle of IR spectroscopy. Explain the modes of vibration water molecule.	6	4	PO1
b)	Differentiate between addition polymerization and condensation polymerization with examples.	4	5	PO2
c)	Describe few advanced ceramic materials with examples and their applications.	4	5	PO12