

End Semester/Reappear (Semester II) Examination May 2025

Programme: B. Tech (MiE & CSE)

Course: Chemistry I

Course Code: 8BSC103 & 3BSC103

Enrolment no. _____

Full Marks: 70

Time: 3 Hrs.

Q.No.	Questions	CO	Bloom Taxonomy Category	Marks
Section I				
1	Short Answer type questions.			4 x 5 = 20
a	What do you mean by radius ratio rule? Give limiting radius for different co-ordinations.	CO1	Understand	
	or			
b	How are substances classified based on their magnetic behavior?	CO1	Understand	
	or			
c	Discuss what are the principal of spectroscopy?	CO2	Understand	
	or			
d	What is the principle of Vibration-Rotation spectroscopy? Explain.	CO2	Analyze	
	or			
e	What are conformers in organic chemistry? List and explain the various conformers of butane.	CO3	Understand	
	or			
f	What are the condition necessary for a molecule to exhibit optical isomerism?	CO3	Understand	
	or			
g	Define EMF of a cell.	CO5	Remember	
	or			
h	Explain equilibrium constant and its significance.	CO5	Understand	
	or			
Section II				
Long Answer type questions.				
2	Elaborate what are the main types of defect that occurs in a solid.	CO1	Understand	3 x 10 = 30
	or			
3	On the basis of band theory describe about different type of metal.	CO1	Analyze	
	or			
4	Explain one of the bonding theory in molecule. VBT or Molecular orbital (MO) theory.	CO3	Understand	
	or			
5	Find out aromatic, anti-aromatic and non-aromatic compound from following. Give reason in behalf of your answer. i. Benzene ii. Benzene anion iii. Cyclopentadien cation iv. Pyrrole v. Pyridine	CO3	Apply	
	or			
6	How would you characterize a catalyst?	CO4	Analyze	
	or			
7	Give mechanism for enzyme catalysis.	CO4	Create	
	or			
Section III				
Application based questions				
8	What do you understand by term CFSE? How do you explain crystal field splitting in octahedral and tetrahedral complexes.	CO1	Create	1 x 20 = 20
	or			
9	How would you explain Jahn Teller distortion and its type?	CO1	Analyze	
	or			

COURSE OUTCOME

CO1 Learn about the bonding in a molecular structure of simple and complex molecule, magnetism and isomerism in complex molecule

CO2 Learn about limitations of classical mechanics and solution in terms of quantum mechanics for atomic/molecular systems. Gain insight into the basic principles of UV, IR and NMR spectroscopic techniques. Use spectroscopic techniques to determine structure and stereochemistry of known and unknown compounds.

CO3 Learn about aromaticity of organic compound identify and differentiate prochirality and chirality at centres, axis and determine the absolute configuration. Evaluate the stability of various conformers of acyclic and cyclic systems

CO4 Learn about the rate of reaction, order and molecularity of reaction, mechanism of a simple as well as catalytic reaction

CO5 Learn about the phases and the electrochemical behaviour of the molecules, EMF of cell and its application.