

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION SP/2024)

CLASS: BTECH/IMSC.
BRANCH: BT/CHEMICAL/CIVIL/MECH/PIE/FT/PHYSICS

SEMESTER : II
SESSION : SP/2024

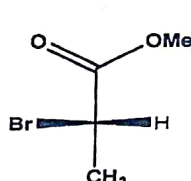
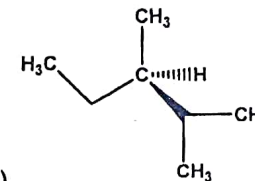
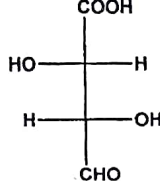
SUBJECT: CH101 CHEMISTRY

TIME: 02 Hours

FULL MARKS: 25

INSTRUCTIONS:

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates

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Q.1(a) Calculate crystal field stabilization energy (CFSE) for the following complexes: (a) $[\text{Fe}(\text{CN})_6]^{3-}$ (b) $[\text{CoCl}_6]^{4-}$	[2]	1	Apply
Q.1(b) Explain bonding in $[\text{CoF}_6]^{3-}$ complex using Valence bond theory.	[3]	1	Understand
Q.2(a) Explain charge transfer phenomenon in complexes with example.	[2]	1	Understand
Q.2(b) Discuss crystal field splitting of d orbitals in tetrahedral complexes with diagram. Why splitting of tetrahedral complex is less in comparison to octahedral complex ?	[3]	1	Understand
Q.3(a) Discuss how the ease of formation of cyclic compounds differs for <i>cis</i> and <i>trans</i> isomers with example.	[2]	2	Understand
Q.3(b) Give the schematic representation of polarimeter .	[3]	2	Remember
Q.4(a) Compare between conformation and configuration with example.	[2]	2	Evaluate
Q.4(b) Assign R and S to the following:	[3]	2	Evaluate
<div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <p>(i)</p> </div> <div style="text-align: center;">  <p>(ii)</p> </div> <div style="text-align: center;">  <p>(iii)</p> </div> </div>			
Q.5(a) Explain how substituted allenes can be optically active, inspite of having no chiral carbon.	[2]	2	Understand
Q.5(b) Explain z-in and z-out Jahn Teller distortion.	[3]	1	Understand

:21/02/2024:::E