BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: BTECH **SEMESTER : I/ADD**
BRANCH: CSE/AIML/ECE/EEE **SESSION : MO/2024**

SUBJECT: CH24101 CHEMISTRY

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	Differentiate between ambidentate and bidentate ligand with example. Explain bonding in $[CoF_6]^{-3}$ complex using Valence bond theory.	[2+3]	CO1	2
Q.1(b)	Explain Z-in and Z-out Jahn Teller distortion with the help of energy level diagram.	[5]	CO1	2
Q.2(a)	Draw the various conformation of n-butane and compare their relative stability with reason.	[5]	CO2	4
Q.2(b)	Explain how substituted biphenyl can be optically active inspite of having no chiral carbon. Compare and contrast between meso isomer and racemic mixtures of any organic compound.	[3+2]	CO2	2
Q.3(a)	A reaction proceeds through the formation of an intermediate B in an unimolecular reaction as follows:  Find the concentration of A, B and C at time t. Also show the graphical representation of variation of concentration A, B and C with time t.	[5]	CO3	4
Q.3(b)	(i) Draw and give the significance of Lineweaver-Burk plot. (ii) Explain the mechanism of Quaternary Ammonium salts as Phase-Transfer Catalyst	[2+3]	CO3	3 2
Q.4(a)	(i) n→ π* Transition in acetone is red shifted on changing the solvent from water to hexane. Explain (ii) What do you mean by 'fingerprint region' of IR absorption spectrum of an organic molecule?	[3+2]	CO4	2
Q.4(b)	Why Tetramethylsilane is used as a standard in NMR ? Why weak spectrum is observed for ^{13}C NMR.	[3+2]	CO4	2
Q.5(a)	Explain "Reduced phase rule". Construct the phase diagram for lead –silver system and describe its use in understanding i) Eutectic point ii)Desilverization of argentiferrous lead.	[1+4]	CO5	2
Q.5(b)	(i) Draw and explain the cooling curve for 100% pure Ag . (ii) Describe the working of H_2-O_2 fuel cell and write down the anodic, cathodic and overall reactions	[2+3]	CO5	3 2

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