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

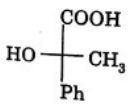
CLASS: B.Sc.(MC) **SEMESTER :Ist**
BRANCH: MATHEMATICS & COMPUTING **SESSION : MO/2025**

SUBJECT: CH24101 CHEMISTRY

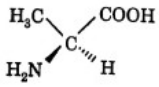
TIME: 3 Hours **FULL MARKS: 50**

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.

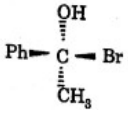
			CO	BL
Q.1(a)	Explain bonding in [Cr(NH3)6]3+ complex using Valence bond theory?	[5]	2	2
Q.1(b)	Calculate crystal field stabilization energy (CFSE) for the following complexes: (a) $[Co(CN)_6]^{3-}$ (b) $[Fe(CN)_6]^{3-}$ (c) $[CoCl_6]^{4-}$	[5]	2	3
Q.2(a)	Draw the geometrical isomers of 2-butene and compare their dipole moment. Give R/S nomenclature for following compounds.	[5]	2	2



A



B



C

Q.2(b)	Write the resonance structures of 1,3-butadiene.	[5]	1	2
Q.3(a)	Explain the kinetics of parallel reaction. A□ B (main reaction) A □ C (side reaction) Graphically represent the variation of concentrations of A, B, C with time.	[5]	1	2
Q.3(b)	Give the mechanism of enzyme catalyzed reaction. Derive Michaelis Merten constant for enzyme catalyzed reaction.	[5]	1	2
Q.4(a)	State the terms involved in Lambert's Beer Law.	[5]	1	2
Q.4(b)	What do you mean by 'fingerprint region' of IR absorption spectrum of an organic molecule?	[5]		
Q.5(a)	Draw a neat labeled phase diagram of *water* system and explain areas, curves and triple point in it.	[5]	2	2
Q.5(b)	What is chemical equilibrium? Explain with example.	[5]	1	2

::::::20/11/2025::::::E