

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

CLASS: BSc
BRANCH: CHEMISTRY

SEMESTER : III
SESSION : MO/2025

SUBJECT: CH221 BASIC CHEMISTRY III

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.
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		CO	BL
Q.1(a)	Explain the Lindermann mechanism for unimolecular reactions and, using the steady-state approximation for the intermediate species, derive the overall rate law. And discuss how this derived rate law successfully accounts for the observed change in reaction order .	[5] 1	1,2
Q.1(b)	Derive Michaelis Menten equation . Also draw and give the significance of Lineweaver-Burk plot.	[5] 1	3
Q.2(a)	Explain conformational isomerism with suitable examples. Describe the different conformations of ethane with the help of Newman projections.	[5] 2	1
Q.2(b)	Explain conformational isomerism in cycloalkanes. Describe the different conformations of cyclohexane and their stability with suitable diagrams.	[5] 2	1
Q.3(a)	Outline HSAB theory. Apply HSAB theory to explain the speciation of minerals.	[5] 3	2,3
Q.3(b)	Compare and contrast the chemical reactions in water and in liquid ammonia as solvent.	[5] 3	2,3
Q.4(a)	Discuss the mechanistic aspects of Markoniuff's rule.	[5] 4	2
Q.4(b)	Discuss why an alkene cannot directly react with water? Outline two pathways of hydration of alkene. Compare and contrast.	[5] 4	2,3
Q.5(a)	Explain the <i>inert pair effect</i> . How does it influence the oxidation states of heavier p-block elements? Illustrate your answer with suitable examples.	[5] 5	1
Q.5(b)	Discuss diagonal relationship and allotropes of s and p block elements with examples.	[5] 5	2

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