

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

CLASS: BSC
BRANCH: CHEMISTRY

SEMESTER : III
SESSION : MO/2025

SUBJECT: CH221 BASIC CHEMISTRY III

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)	Show that in case of first order reaction, the time required for 99.9% of the reaction to take place is about ten times that requires for half of the reaction.	[2] 1	5
Q.1(b)	Derive the rate equation for chain reaction between hydrogen and bromine. Describe the initiation, propagation, and termination steps in detail.	[3] 1	3
Q.2(a)	Discuss any two factors affecting rate of a reaction.	[2] 1	2
Q.2(b)	Explain the mechanism of homogeneous catalytic hydrogenation of alkenes using Wilkinson's catalyst.	[3] 1	2
Q.3(a)	Discuss autocatalysis with the help of example.	[2] 1	2
Q.3(b)	How 'solvated electrons' can be generated in liquid ammonia? Elaborate the properties of such solution.	[3] 3	2
Q.4(a)	Discuss with suitable examples, the attributes of a molecular species that makes it a good Lewis acid.	[2] 3	2
Q.4(b)	The reaction of nitric acid with liquid ammonia is a Bronsted Lowry acid-base reaction but not an Arrhenius acid-base reaction. Elaborate.	[3] 3	2
Q.5(a)	HSAB theory dictates the 'site of attack' in organic reactions. Elaborate with suitable examples.	[2] 3	3
Q.5(b)	Which one among the following NH_2^- and PH_2^- is better Lewis base towards proton? Why?	[3] 3	3

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