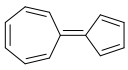
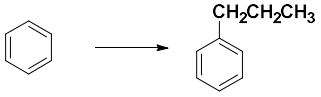
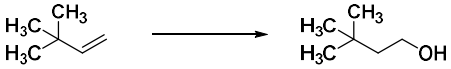
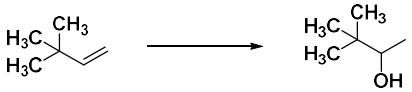
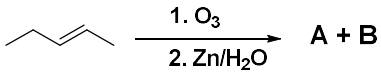
BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: IMSc **SEMESTER : IV**
BRANCH: MATHEMATICS **SESSION : SP/2025**

SUBJECT: CH213 CHEMISTRY II

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)	Express pressure of a gas in terms of its molecular quantities.	[5]	1	2
Q.1(b)	Outline the strokes falling sphere method of measurement of viscosity of a liquid. Elaborate the relevant mathematical expression.	[5]	2	2
Q.2(a)	Compare and contrast Arrhenius, Bronsted and Lewis concept of acids and bases. Give example of an acid-base pair which can be classified by Bronsted – Lowry concept of acids and bases but not by Arrhenius concept.	[5]	2	2
Q.2(b)	Outline HSAB theory. Elaborate the application of HSAB theory in mineralogy.	[5]	2	3
Q.3(a)	 Fulvalene molecule shows exceptionally high dipole moment. Why?  Why does cyclopentene show relatively higher acidity than expected?	[5]	3	3
Q.3(b)	What is Friedel Craft alkylation reaction. Explain with a suitable example. How to carry out the following conversion without any side product? 	[5]	3	2
Q.4(a)	Elaborate with well labelled schematics, the construction and chemistry of Leclanché cell (Dry cell).	[5]	4	2
Q.4(b)	Discuss with well labelled schematics, the construction and working of Proton Exchange Fuel Cell (PEFC).	[5]	4	2
Q.5(a)	How to carry out the following conversions.   What are A and B in the following reaction scheme? 	[5]	5	3
Q.5(b)	What are the differences between E2 and E1cB mechanism? With a suitable example, explain how one can determine the possibility of E2 or E1cB mechanism.	[5]	5	2

::::::25/04/2025::::::M