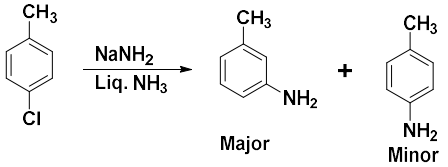
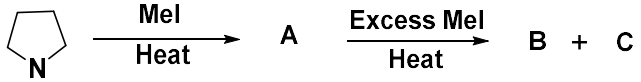
BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: BSc **SEMESTER : IV**
BRANCH: CHEMISTRY **SESSION : SP/2025**

SUBJECT: CH225 BASIC CHEMISTRY V

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)	Discuss with a well labelled schematics the 'Moving boundary method' of estimation of transference number of ions.	[5]	1	2
Q.1(b)	Elaborate the potentiometric-argentometric titration based method of estimation of chloride in a given sample of water.	[5]	1	3
Q.2(a)	Explain with a suitable example that rate of racemization is double of rate of inversion. Why does allyl chloride (CH_2=CH–CH_2Cl) undergo S_N1 reaction even though it is a primary alkyl chloride?	[5]	2	2
Q.2(b)	Explain the observation of retention in configuration of the chiral center when 2-bromopropanoic acid is converted into 2-hydroxypropanoic acid using dilute NaOH.	[5]	2	3
Q.3(a)	Name the following complexes: 1. $[Co(NH_3)_6]Cl_3$ 2. $[Cd(SCN)_4]^{2+}$ 3. $Na_3[Ag(S_2O_3]$ 4. $Fe(C_5H_5)_2$ 5. $K_2[Cr(CN)_2O_2(O_2)NH_3]$	[5]	3	3
Q.3(b)	What is Crystal field splitting in an octahedral field? How is it different from splitting in tetrahedral field splitting?	[5]	3	3
Q.4(a)	Explain the hybridization in benzyne. Explain the product ratio of the following reaction.  	[5]	4	2
Q.4(b)	How one can distinguish between E_2 and E_1CB mechanism? What are A, B and C? Explain with proper mechanism.  	[5]	4	3
Q.5(a)	Describe the general characteristics of transition elements and trends with respect to atomic and ionic radii?	[5]	5	2
Q.5(b)	Discuss how the phenomena d-d transition and charge transfer are responsible for imparting color to transition metal complexes?	[5]	5	2

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