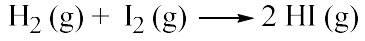
BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION SP/2025)

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

SUBJECT: CH226 BASIC CHEMISTRY VI

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**

			CO	BL
Q.1(a)	What is Vant Hoff reaction isotherm? Explain its significance.	[2]	1	II
Q.1(b)	Derive the relationship between K_P and K_C for the following reaction 	[3]	1	II
Q.2(a)	Graphically explain, how does equilibrium constant (K_P) vary with temperature for endo-and exo-thermic reaction?	[2]	1	II
Q.2(b)	Derive Vant Hoff equation relating equilibrium constant with temperature.	[3]	1	II
Q.3(a)	Demonstrate the preparation of primary and secondary alcohol using Grignard reagent with reaction scheme and mechanism.	[2]	2	II
Q.3(b)	Why is diethyl ether or THF is preferred choice of solvent for the preparation of Grignard Reagent? Describe the preparation of acetic acid using a suitable Grignard Reagent.	[3]	2	II
Q.4(a)	What is the reduced phase rule?	[2]	5	I
Q.4(b)	Consider the thermal decomposition of $CaCO_3$ in a closed vessel. Determine the number of phases and number of components in this case.	[3]	5	II
Q.5(a)	Derive the Clausius-Clapeyron Equation.	[2]	5	I
Q.5(b)	Draw the phase diagram of water. Calculate the degree of freedom for the sublimation curve therein.	[3]	5	II

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