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

CLASS: BSC **SEMESTER : I**
BRANCH: CHEMISTRY **SESSION: MO/2025**

SUBJECT: CH121 BASIC CHEMISTRY-I

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 compressibility factor? Prove that real gas behaves differently than the ideal gas.	[2]	1	2
Q.1(b)	What are volume and pressure corrections in deriving van der Waal equation?	[3]	1	1
Q.2(a)	Using Andrews isotherm, explain the phenomenon “continuity of states”?	[2]	1	2
Q.2(b)	What are critical constants? Prove that V_C = 3b, where the symbols have their usual significance.	[3]	1	1
Q.3(a)	What is hyperconjugation? Write the hyperconjugating structure of CH_3-CH=CH_2.	[2]	2	2
Q.3(b)	Write the necessary condition for resonance.	[3]	2	2
Q.4(a)	What is double bond equivalent? Calculate BDE for benzene and Cyclohexane.	[2]	2	3
Q.4(b)	Draw the orbital picture of acetonitrile (CH_3CN)	[3]	2	1
Q.5(a)	What is the significance of the quantum number with respect to orbitals.	[2]	3	2
Q.5(b)	What is node? Draw the probability density with distance graph for the 1s, 2s and 2p orbitals.	[3]	3	2

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