

(For those admitted in June 2023 and later)

PROGRAMME AND BRANCH: B.Sc., CHEMISTRY

SEM	CATEGORY	COMPONENT	COURSE CODE	COURSE TITLE
I	PART - III	CORE - 1	U23CH101	GENERAL CHEMISTRY_ I

Maximum: 75 Marks

[illegible]

Course Outcome	Bloom's K-level	Q. No.	SECTION – B (5 X 5 = 25 Marks) Answer ALL Questions choosing either (a) or (b)
CO1	K3	11a.	State and explain Pauli's exclusion principle. (OR)
CO1	K3	11b.	Discuss the dual nature of matter.
CO2	K3	12a.	Compare the Bohr orbit and orbital. (OR)
CO2	K3	12b.	Distinguish between s and p- block elements.
CO3	K4	13a.	Illustrate the Fajans' rules. (OR)
CO3	K4	13b.	How does molecular geometry influence its magnitude? Illustrate with examples like CO ₂ and H ₂ O.
CO4	K4	14a.	Difference between bonding and antibonding molecular orbitals. (OR)
CO4	K4	14b.	Compare VBT and MOT.
CO5	K5	15a.	Tertiary carbocations are more stable. Justify. (OR)
CO5	K5	15b.	Illustrate the homolytic cleavage of Cl ₂ and the heterolytic cleavage of HCl using appropriate arrow notation.

Course Outcome	Bloom's K-level	Q. No.	SECTION – C (5 X 8 = 40 Marks) Answer ALL Questions choosing either (a) or (b)
CO1	K3	16a.	Explain why Bohr's model fails for multi-electron atoms. What quantum mechanical principles supersede Bohr's assumptions? (OR)
CO1	K3	16b.	Explain how the Davisson-Germer experiment validates de Broglie's hypothesis.
CO2	K4	17a.	Analyse the postulates of quantum mechanics. (OR)
CO2	K4	17b.	Illustrate the electronegativity scale.
CO3	K4	18a.	Describe the Born Haber cycle and determine the lattice energy of NaCl. (OR)
CO3	K4	18b.	Discuss the structure of PF ₅ & SF ₆ .
CO4	K5	19a.	Sketch the MO diagram of N ₂ molecules and explain the behaviour. (OR)
CO4	K5	19b.	Evaluate the role of hydrogen bonding in determining the anomalous physical properties of water, such as its high boiling point & melting point of nitrophenol.
CO5	K5	20a.	Illustrate the +I and –I effects with examples of alkyl and halogen groups. How do these effects influence carbocation stability? (OR)
CO5	K5	20b.	Classify the following reactions as substitution, addition, or elimination: $\text{CH}_2=\text{CH}_2 + \text{HBr} \rightarrow \text{CH}_3\text{CH}_2\text{Br}$ $\text{CH}_3\text{CH}_2\text{OH} \rightarrow \text{CH}_2=\text{CH}_2 + \text{H}_2\text{O}$ $\text{CH}_3\text{CH}_2\text{Br} + \text{NaOH} \rightarrow \text{CH}_3\text{CH}_2\text{OH} + \text{NaBr}$