Reg. No.				

## G. VENKATASWAMY NAIDU COLLEGE (AUTONOMOUS), KOVILPATTI - 628 502.



## UG DEGREE END SEMESTER EXAMINATIONS - NOVEMBER 2025.

(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

Date & Session: 07.11.2025/FN Time: 3 hours Maximum: 75 Marks

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Course Outcome	Bloom's K-level	Q. No.	<u>SECTION - A (10 X 1 = 10 Marks)</u> Answer <u>ALL Questions.</u>
CO1	K1	1.	The electronic configuration of Sodium (Atomic No. 11) is  a) 1s <sup>2</sup> 2s <sup>2</sup> 2p <sup>6</sup> 3s <sup>2</sup> b) 1s <sup>2</sup> 2s <sup>2</sup> 2p <sup>6</sup> 3s <sup>1</sup> c) 1s <sup>2</sup> 2s <sup>2</sup> 2p <sup>6</sup> d) 1s <sup>2</sup> 2s <sup>2</sup> 2p <sup>5</sup> 3s <sup>2</sup>
CO1	K2	2.	According to Dalton's Atomic Theory, matter consists of indivisible  a) Molecules
CO2	K1	3.	Which of the following halogen having highest electronegativity?  a) F  b) Cl c) Br  d) I
CO2	K2	4.	Which of the following is a noble gas?  a) Sodium (Na) b) Oxygen (O) c) Neon (Ne) d) Fluorine (F)
CO3	K1	5.	Which is an ionic compound?  a) NaCl b) Glucose c) CH <sub>4</sub> d) Ethanol
CO3	K2	6.	Identify the molecule having sp³ hybridisation?  a) CO <sub>2</sub> b) BeCl <sub>2</sub> c) CH <sub>4</sub> d) C <sub>2</sub> H <sub>2</sub>
CO4	K1	7.	The bond order od O <sub>2</sub> molecule is a) 1 b) 2 c) 3 d) 4
CO4	K2	8.	When two species A and B form an electron-pair bond and A does not provide its electrons for bonding, the bond present between A and B must be  a) ionic
CO5	K1	9.	Carbonium ion is Hybridised. a) sp b) sp <sup>2</sup> c) sp <sup>3</sup> d) dsp <sup>2</sup>
CO5	K2	10.	Identify the electrophile in the following?  a) NH <sub>3</sub> b) H <sub>2</sub> O c) CH <sub>3</sub> SH d) BF <sub>3</sub>

Course Outcome	Bloom's K-level	Q. No.	$\frac{\text{SECTION} - B \text{ (5 X 5 = 25 Marks)}}{\text{Answer } \frac{\text{ALL}}{\text{Questions choosing either (a) or (b)}}$
CO1	КЗ	11a.	State and explain Pauli's exclusion principle. (OR)
CO1	КЗ	11b.	Discuss the dual nature of matter.
CO2	КЗ	12a.	Compare the Bohr orbit and orbital. (OR)
CO2	КЗ	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 <sub>2</sub> and H <sub>2</sub> 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	Bloom's K-level	Q. No.	$\frac{\text{SECTION} - C \text{ (5 X 8 = 40 Marks)}}{\text{Answer } \underline{\text{ALL }} \text{Questions choosing either (a) or (b)}}$
CO1	К3	16a.	Explain why Bohr's model fails for multi-electron atoms. What quantum mechanical principles supersede Bohr's assumptions? (OR)
CO1	КЗ	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 <sub>5</sub> & SF <sub>6</sub> .
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: $CH_2=CH_2+HBr\to CH_3CH_2Br$ $CH_3CH_2OH\to CH_2=CH_2+H_2O$ $CH_3CH_2Br+NaOH\to CH_3CH_2OH+NaBr$