Reg. No. | | | | | | | | |

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

UG DEGREE END SEMESTER EXAMINATIONS - NOVEMBER 2025.

(For those admitted in June 2021 and later)

PROGRAMME AND BRANCH: B.Sc., CHEMISTRY

SEM	CATEGORY	COMPONENT	COURSE CODE	COURSE TITLE
I	PART-III	CORE	U21CH101	INORGANIC CHEMISTRY-I

Date & Session: 03.11.2025/AN **Time: 3 hours** **Maximum: 75 Marks**

Course Outcome	Bloom's K-level	Q. No.	**SECTION – A (10 X 1 = 10 Marks)** **Answer ALL Questions.**
CO1	K1	1.	When the value of azimuthal quantum number is 2, the magnetic quantum number can have values? a) +1, -1 b) +2, +1, 0, -1, -2 c) +1, 0, -1 d) None
CO1	K2	2.	The relation between momentum and wavelength is verified by _____. a) Bohr b) Mendeleef c) de Broglie d) Lother Mayer
CO2	K1	3.	Aluminium has a diagonal relationship with _____. a) Be b) B c) C d) Si
CO2	K2	4.	Which of the following salts of elements is not of transition elements? a) Ti, Zr, Hf b) Fe, Co, Ni c) Ga, In, Tl d) Cu, Ag, Au
CO3	K1	5.	Which has the least ionisation energy? a) Li b) Cs c) Cl d) I
CO3	K2	6.	Which of the following has highest electronegativity? a) B b) N c) F d) Br
CO4	K1	7.	Which of the following is an example for sp hybridisation? a) BCl_3 b) $BeCl_2$ c) $SnCl_4$ d) PCl_5
CO4	K2	8.	Which of the following is paramagnetic? a) F_2 b) N_2 c) O_2 d) Cl_2
CO5	K1	9.	CH_4 is. a) Saline hydride b) Covalent hydride c) Polymeric hydride d) Metallic hydride
CO5	K2	10.	Which one of the following noble gases is obtained by radioactive disintegration? a) Kr b) Ar c) Rn d) Xe
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.	Apply Bohr's postulates to explain how emission spectra of hydrogen are formed. **(OR)**
CO1	K3	11b.	Apply Hund's Rule to explain the electronic configuration of oxygen.

CO2	K3	12a.	Classify the elements into s, p, d, or f block **(OR)**
CO2	K3	12b.	Predict the trend in atomic radii across period 3 and explain using periodic law.
CO3	K4	13a.	Examine how lone pairs affect the molecular geometry of NH_3 and H_2O compared to CH_4 using VSEPR theory. **(OR)**
CO3	K4	13b.	Examine the relationship between lattice energy and ionic size/charge using Born-Lande equation factors
CO4	K4	14a.	Analyze the dual nature of hydrogen and justify its position with reference to both alkali metals and halogens. **(OR)**
CO4	K4	14b.	Analyze the diagonal relationship between lithium and magnesium using their physical and chemical similarities.
CO5	K5	15a.	Assess why p-block elements show a wider range of properties compared to s- and d-block elements. **(OR)**
CO5	K5	15b.	Evaluate the reasons why nitrogen (group 15) differs markedly from the rest of its group in bonding and oxidation states.

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.	Use Schrödinger's wave equation to explain the concept of quantized energy levels in the hydrogen atom. **(OR)**
CO1	K3	16b.	How can Schrödinger's equation be used to determine the probability of finding an electron in a given region?
CO2	K4	17a.	Analyze the trend in ionization energy across a period and down a group with appropriate reasons. **(OR)**
CO2	K4	17b.	Analyze the role of electronegativity in determining the polarity of molecules such as H_2O and CO_2.
CO3	K4	18a.	Using MOT, analyze why O_2 is paramagnetic while F_2 is not. Justify with molecular orbital diagrams. **(OR)**
CO3	K4	18b.	Compare and contrast VBT and MOT in terms of their explanation of bonding and molecular properties.
CO4	K5	19a.	Critically assess how hydration energy influences the lattice energy and solubility of ionic compounds in Group 1 and 2 elements. **(OR)**
CO4	K5	19b.	Evaluate the usefulness of hydrides in hydrogen storage technologies and suggest which type of hydride is most suitable and why.
CO5	K5	20a.	Compare interhalogen compounds with pure halogens in terms of reactivity, structure, and bond polarity, and evaluate their use as halogenating agents. **(OR)**
CO5	K5	20b.	Judge the significance of the polymeric structure of silicones in determining their thermal stability, water repellence, and flexibility.