QP Code: D132377		
	Total Pages:2	**Name:**
		Register No.

FIRST SEMESTER UG DEGREE EXAMINATION, NOVEMBER 2025

(CUFYUGP)

CHE1CJ 101 /CHE1MN 100 INORGANIC CHEMISTRY - I

2024 Admission onwards

Maximum Time :2 Hours	Maximum Marks :70

Section A

All Questions can be answered. Each Question carries 3 marks (Ceiling : 24 Marks)

1	Explain the difference between accuracy and precision in analytical data, providing an example for each.
2	Define relative standard deviation and coefficient of variation.
3	A chemical analysis yielded a mean of 10 with a standard deviation of 0.2. Calculate the coefficient of variation.
4	State the difference between constant errors and proportional errors in chemical analysis.
5	Differentiate between top-down and bottom-up approaches for the synthesis of nanomaterials, giving one example of each.
6	What is the significance of the surface area to volume ratio in determining the novel properties of nanomaterials?
7	Define and provide one example each for nanocomposites and nanoceramics.
8	State the purpose of a material safety data sheet (MSDS).
9	Define mole fraction and molality.
10	Give the principle and two advantages of the double burette method of titration.

Section B

All Questions can be answered. Each Question carries 6 marks (Ceiling : 36 Marks)

11	Describe the Q test as a method for the rejection of a doubtful result in analytical data.
12	Explain Fajans' rule and discuss how it is used to predict the covalent character in an ionic bond.
13	Discuss the factors that affect the formation of an ionic bond. Give two characteristics of ionic compounds.
14	Explain the variation of Ionization energy and electron affinity across a period and down a group in the periodic table.
15	Using the concept of hybridization, predict and draw the structure of XeO_3.
16	Explain the synthesis and characteristics of carbon nanotubes (CNTs) and graphene .
17	Explain the theory of acid-base indicators and redox indicators.
18	Outline the essential safety procedures and first aid measures to be taken in a lab in case of electric shock and inhalation of poisonous gas.

Section C	
Answer any ONE .Each Question carries 10 marks (1x10=10 Marks)	
19	a) Describe the Born-Haber cycle for the calculation of lattice energy of an ionic compound . (5 marks) b) Using MO theory, compare the bond order, bond length, and stability of N_2 and N_2^+. (5 marks).
20	Discuss the concept of dipole moment and explain its applications in: (i) Predicting the linearity and symmetry of polyatomic molecules. (ii) Prediction of the position of substituents in aromatic compounds.