

SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)

(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.

B.Sc.Chemistry - END SEMESTER EXAMINATIONS - APRIL 2025

SEMESTER - I

22UCHCT1001 - Basic Concepts in Inorganic Chemistry

Total Duration : 2 Hrs.30 Mins.

Total Marks : 60

Section B

Answer any **SIX** questions ($6 \times 5 = 30$ Marks)

1. Explain dual behaviour of matter and formulate de Broglie's equation.
Show that Davisson and Germer experiment supports it.
2. a) State and explain Fajan's rule.
b) Draw and discuss the MO diagram for the formation of NO molecule. (2+3)
3. a) Find the intercepts and draw the Miller planes (120) and (001).
b) Draw the diagram of three seven primitive unit and give one example for each. (2+3)
4. Illustrate the HSAB principle and write its applications.
5. Describe in details the Pauling scales of electro negativity.
Write any one applications of electro negativity
6. a) What is the coordination number? Write the coordination number
 Zn^{2+} and S^{2-} ions in Wurzite.
b) Differentiate intra molecular and inter molecular hydrogen bonding with suitable examples. (2+3)
7. State Bragg's law and derive Bragg's equation with neat diagram.
8. Justify and balance the following equation by ion electron method
 $Cr_2O_7^{2-} + Fe^{2+} + H^+ \rightarrow Cr^{3+} + Fe^{3+} + H_2O.$

Section C

Answer any **THREE** questions ($3 \times 10 = 30$ Marks)

9. a) Illustrate Bohr's model of the atom, detailing its postulates, applications, and limitations in explaining atomic behaviour
b) Apply the principles involved in the arrangement of electrons in atoms
i) Pauli's Exclusion Principle ii) Hund's Rule (6+4)

Contd...

10. Classify the term ionization energy. Explain how does it differ across the period and along the group in the periodic table.
11. Using Born Haber cycle explain the experimental determination of lattice energy of NaCl crystal. Explain the classification of metals using band theory
12. a) Difference between crystalline and amorphous solid.
b) Apply the Bravais lattices in a cubic system, Draw and calculate the number of atoms per unit cell in each case.
a) Simple cubic b) Body centered cubic c) Face centered cubic
13. a) Evaluate the acids and bases in terms of
i) Lowry concept ii) Lux- Flood concept
b) Discuss the reactions takes place in alkali metal- ammonia solutions?
Give the characteristics of this solution. (6+4)
