Roll.No. | 25UCHCT1001

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 - NOVEMBER 2025
SEMESTER - I
25UCHCT1001 - 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. An accelerated electron has a speed of 5x$10^{6} ms^{-1}$ with an uncertainty of 0.02%. The uncertainty in finding its location while in motion is y x $10^{-9} m$. Find the value of y. [mass of electron $= 9.110^{-31} kg, h = 6.63$ x $10^{-34} Js, \pi = 3.14$]
2. Show the periodic variations in ionization energy and list their applications.
3. Explain the band theory of metals in conductors and semi-conductors.
4. Show the electronic configuration, atomic orbital and molecular orbital for carbon monoxide in MO diagram.
5. Differentiate the following:
   (i) Crystalline and amorphous solids.
   (ii) Isotrophy and anisotrophy.
6. Discuss the factors that influence the electron affinity of elements.
7. Sketch the crystal structure of CsCl and explain its packing fraction.
8. Write short notes on Bronsted–Lowry and Lewis theories of acids and bases with examples.

Section C

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

9. Explain the following:
   (i) Pauli's Exclusion Principle.
   (ii) Hund's rule of maximum multiplicity.
   (iii) Aufbau's principle and its limitations.
10. How would you obtain the values of electro negativity using Pauling's and Mulliken's scales? Explain with example.
11. Illustrate the Born-Haber cycle for the formation of NaCl.

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12. Discuss the various defects in crystals with neat sketch.

13. (a) Explain the principles of qualitative analysis.
    Apply the oxidation number method and balance the following equation.
    $MnO_4^- + H^+ + 5C_2O_4^{2-} \rightarrow 2M_n^{2+} + Co_2 + H_2O$

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