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. END SEMESTER EXAMINATIONS NOVEMBER-2022
SEMESTER - I
22UCHCT1001 - Basic Concepts in Inorganic Chemistry

Total Duration : 2 Hrs 30 Mins.   Total Marks : 60

Section A

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

1. Illustrate the shapes of s, p and d-orbital with neat diagrams.

2. Calculate the effective nuclear charge of the following:
    (i) 4s electron in potassium atom
    (ii) last electron in an atom whose configuration is $1s^2, 2s^2p^6, 3s^2p^5$

3. Explain the general characteristics of d-block elements.

4. Classify p-type and n-type semiconductor based on Band theory
   with suitable example.

5. Calculate the Lattice energy of Ionic solid MX, using Born-Haber cycle.

6. Examine the Frenkel defect in an elaborate manner and distinguish the differences
   between Schottky and Frenkel defects.

7. Justify the reaction:
       $2Cu_2O(S) + Cu_2S$ (s) $\rightarrow 6Cu$ (s) $+ SO_2$ (g) is a redox reaction.
   Identify the species oxidized, and reduced, which acts as an oxidant and which
   acts as a reductant.

8. Classify solvents based on proton donor acceptor property with suitable examples.

Section B

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

9. Analyze the salient features of Bohr's atomic model and discuss its limitations
   in detail

10. Assess Pauling approach and Mullikens approach and Allred Rochow
    scale of Electronegativity.

11. State the postulates of VSEPR theory and apply VSEPR theory to explain the
    shape and structure of BF_3, SF_6 and IF_7 molecules.

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12. Perceive the different ways of packing of ions in ionic crystals.

13. Assess the application of HSAB principle in predicting the feasibility of a reaction and stability with suitable examples.

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