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.
M.Sc.Chemistry - END SEMESTER EXAMINATIONS - NOV' 2024
SEMESTER - I

22PCHCT1002 - Structural Inorganic Chemistry and Photochemistry

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

Section B

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

1. List the basic principles of chemical vapor deposition.
2. Describe the structure of AX compounds like Zinc Blende and Wurtzite.
3. Apply band theory to explain the electrical conductivity.
4. Explain the Type I and Type II superconductors .
5. What are the characteristics of silicates containing sheets and framework silicates?
6. Discuss the methods of preparation, structure and bonding in borazines.
7. Apply wade's rule to predict the structure of the following compounds:
   i) $B_5H_9^{2-}$ ii) $C_2B_{10}H_{12}$ iii) $G_eB_4H_8$.
8. Determine the mechanism of photoredox reactions in Co(III) coordination complexes.

Section C

I - Answer any **TWO** questions $(2 \times 10 = 20$ Marks)

9. a) Explain the metal cations that are arranged within spinels structure.
   b) Predict the material that forms a superstructure and explain the significance of this superstructure in its properties.
10. Predict the general structure of zeolites, synthesis and its application.
11. a) Examine the synthesis of metallacarboranes
    b) Justify metal-metal multiple bonding in $(Re_2X_8)^{2-}$
12. Evaluate the role of $[Ru(bpy)3]^{2+}$ complex in photosensitization reactions. How is this complex utilized in solar energy conversion and Dye-Sensitized Solar Cells (DSSCs)?

II - Compulsory question $(1 \times 10 = 10$ Marks)

13. Explain the following with suitable examples :
    (a) Paramagnetism (b) Diamagnetism (c) Ferromagnetism
    (d) Antiferromagnetism (e) Ferrimagnetism

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