❖ Problems

Q 1. Discuss the molecular orbital treatment of three-center two-electron bond in detail.

Q 2. What are the STYX numbers? How would you use the Lipscomb's model to find out the STYX code for B_4H_{10} cluster system?

Q 3. Draw and discuss the structure and bonding in B_5H_9 and B_5H_{11}.

Q 4. How many B–H–B and B–B–B bonds are present in $B_{10}H_{14}$ cluster?

Q 5. Discuss the structural relationship between closo, nido and arachno type boranes.

Q 6. What are Wade's rules? How can we use these rules to predict the structures of $B_5H_5^{4-}$ and P_4 clusters?

Q 7. What are carboranes? Explain with suitable examples.

Q 8. Draw and discuss the structural pattern correlation between closo, nido and arachno type carboranes.

Q 9. What are the low nuclearity carbonyl clusters? How do they differ from the high nuclearity ones?

Q 10. How would you calculate the number of metal-metal bonds in $Fe_3(CO)_{12}$ and $Ir_4(CO)_{12}$?

Q 11. Define total electron count (TEC).

Q 12. Explain the electron counting scheme for high nuclearity carbonyl clusters in detail.

Q 13. How would you explain the isolobal Analogy Between $Ru(CO)_3$ And BH units?

Q 14. Using total electron count (TEC), explain the structure of $Rh_6(CO)_{16}$ and $Os_5C(CO)_{15}$.

Q 15. Describe the correlation between total electron count (TEC) and skeletal electron pairs (SEP), and use same to predict the structures of $[Fe_4N(CO)_{12}]^-$ and $[H_3Ru_4(CO)_{12}]^-$.

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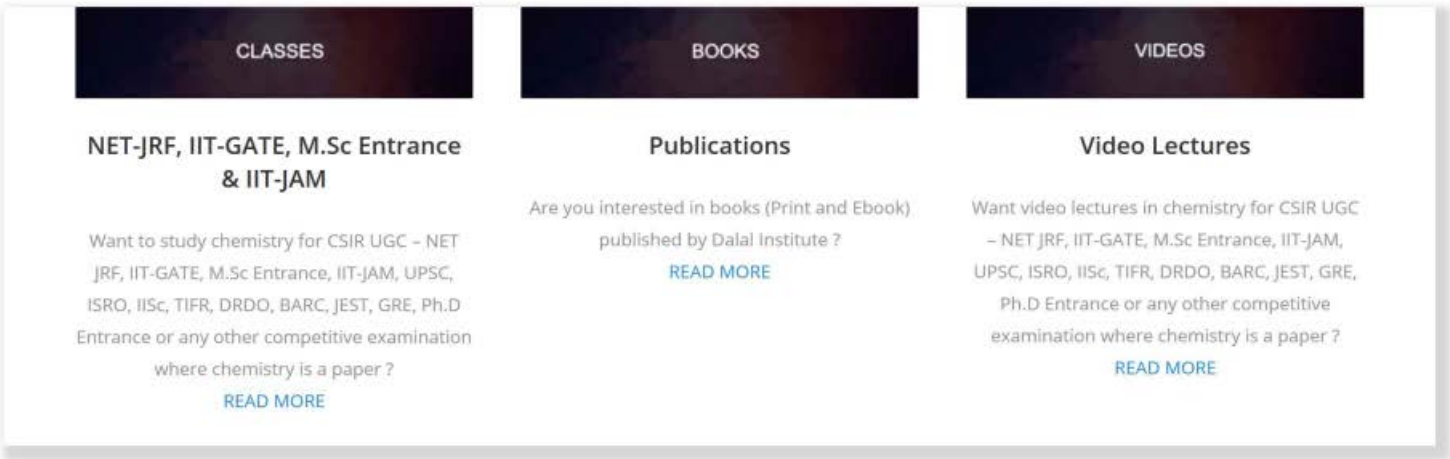

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