



THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Answer the following short questions:

(15x2=30)

- (i) What are outer orbital complexes? Give some examples.
- (ii) Discuss the structure of $Fe_2(CO)_9$
- (iii) Calculate the CFSE of d^5 system.
- (iv) Discuss the shape of d-orbitals.
- (v) How MOT or LFT is superior to VBT and CFT?
- (vi) Discuss the preparation of $Ni(CO)_4$
- (vii) Write a note on P-type semiconductors.
- (viii) What are limitations of CFT?
- (ix) Discuss the crystal field splitting in square planar complexes on the basis of CFT.
- ~~(x) Show the hybridization of $[Co(NH_3)_6]^{+3}$.~~
- (xi) Write the name of following:
 - (a) $[Fe(CN_6)]^{-3}$
 - (b) $K_2(PtCl_6)$
- (xii) What is action of heat on? (a) $Fe_3(CO)_{12}$ (b) $Ni(CO)_4$
- (xiii) Apply EAN rule to the following metal carbonyl.
 - (a) $V(CO)_5$
 - (b) $Mn_2(CO)_{10}$
- (xiv) Discuss the structure of $Fe(CO)_5$.
- (xv) Draw N(E) curves for N-type semiconductors?

Q.2. Answer the following questions.

(3x10=30)

- 1 Explain the difference in conductivity of univalent, bivalent and trivalent metals on the basis of N(E) curves.
- 2 Explain on the basis of valence bond theory and molecule orbital theory structures of $[CoF_6]^{-3}$ and $[Co(NH_3)_6]^{+3}$.
- 3 (a) What are n(E) curves?
(b) Describe general methods of preparation of metal carbonyls