



Q.1. Give short answers of the following: (15x2=30)

- (i) What do you mean by d-d transition?
- (ii) Give the structures of dioxalato platinate(II) ion and dichlorobis (ethylene diammine) cobalt (II)
- (iii) What is action of heat on? (i) $Fe_3(CO)_{12}$ (ii) $Ni(CO)_4$
- (iv) Discuss the shapes of d-orbitals.
- (v) What do you mean by effective atomic number (EAN) rule? Give examples?
- (vi) What are trinuclear carbonyls? Give one example with structure.
- (vii) Calculate the EAN per metals atom of the following (1) $Mn_2(CO)_{10}$ (2) $Fe_3(CO)_{12}$
- (viii) Give the structure of $Fe(CO)_5$.
- (ix) What are the reactions of $Fe(CO)_5$ with the following? (1) NaOH (2) H_2SO_4
- (x) Write the formula of carbonyl hydride with the example and preparation.
- (xi) What do you understand by extrinsic semiconductor?
- (xii) What do you understand by fermi-level?
- (xiii) Briefly explain N(E) curves?
- (xiv) Discuss the preparation of $Ni(CO)_4$.
- (xv) Discuss the d^2sp^3 hybridization with one example.

Q.2. Give brief answers of the followings. (3x10=30)

- 1 Discuss the band theory of metals and apply band theory to explain semiconductors, insulators, conductors.
- 2 Discuss the postulates of crystal field theory and discuss the crystal field theory splitting of octahedral, tetrahedral and square planar system on the basis of CFT.
- 3 Discuss the structure and nature of M-CO bonding (in metal carbonyls) in detail with examples?