



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

Q.1. Answer the following short questions: (15x2=30)

- (i) What do you mean by effective atomic number (EAN) rule? Give examples?
- (ii) What are binuclear carbonyls? Give one example with structure.
- (iii) Calculate the EAN per metals atom of the following (i)  $Mn_2(CO)_{10}$  (ii)  $Fe_3(CO)_{12}$
- (iv) Give the structure of  $Fe(CO)_5$ .
- (v) What are the reactions of  $Fe(CO)_5$  with the following? (i) NaOH (ii)  $H_2SO_4$
- (vi) Differentiate between primary and secondary valency in co-ordination compounds.
- (vii) What do you mean by chelation? Give examples.
- (viii) Define ambidentate ligands. Give examples.
- (ix) Define inner orbital complex. Give examples.
- (x) Discuss the  $dsp^2$  hybridization with one example.
- (xi) What is the effect of impurity in conductors?
- (xii) Discuss N(E) curve for non-metals.
- (xiii) Discuss the electron cloud theory for the metallic bond.
- (xiv) Define n(E) curves. With examples.
- (xv) Discuss the structure of  $Fe_3(CO)_{12}$ .

Q.2. Answer the following questions. (3x10=30)

1. Discuss the structure and nature of M-CO bonding in metal carbonyls with examples.
2. Discuss crystal field splitting for common geometries.
3. Discuss N(E) curves to explain the conductivity in bivalent metals and semiconductors.