NOVEMBER/DECEMBER 2019

MCH32 — INORGANIC CHEMISTRY - III

Time : Three hours Maximum : 75 marks

SECTION A — (5 × 6 = 30 marks)

Answer ALL questions.

(a) Discuss the nature of bonding in metal nitrosyls.

Or

(b) Describe addition and elimination reactions.

2. (a) Give Tolman catalytic loops for alkene hydrogenation.

Or

(b) Explain the mechanism of Wacker process.

3. (a) Describe the influence of the bridging ligand on inner sphere electron transfer reactions.

Or

(b) Write notes on complementary, non-complementary and two electron transfer reactions.

4. (a) Discuss the factors affecting the rates of substitution reactions in square planar complexes.

Or

(b) Describe the applications of *trans* effect in synthesis of complexes.

5. (a) Describe the mechanism of base hydrolysis reactions of octahedral Co(III) complexes.

Or

(b) Explain photoredox reactions of coordination complexes.

SECTION B — (3 × 15 = 45 marks)

Answer any THREE questions.

6. What are metallocenes? Discuss the synthesis, structure and bonding in ferrocene.

7. (a) What is hydroformylation? Explain the mechanism of this reaction using $HCo(CO)_4$ catalyst. (8)

(b) Discuss the mechanism of Zeigler-Natta catalyst for the polymerization. (7)

8. (a) Describe the outer sphere mechanism of redox reactions in coordination compounds giving a suitable example. (7)

(b) Give a comparative account of inner sphere and outer sphere mechanisms of electron transfer reactions. (8)

9. What is *trans* effect? Discuss the theories of *trans* effect.

10. (a) Discuss the mechanism of acid hydrolysis reactions of octahedral Co(III) complexes. (8)

(b) Describe the application of metal complexes in solar energy conversion. (7)