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## **MCH-506**

### **Inorganic Chemistry-II**

M.Sc. Chemistry (MSCCH)

2nd Semester Examination, 2023 (June)

**Time : 2 Hours]**

**[Max. Marks : 35**

**Note :** This paper is of Thirty Five (35) marks divided into two (02) Sections A and B. Attempt the questions contained in these sections according to the detailed instructions given therein. Candidates should limit their answer to the questions on the given answer sheet. No additional (B) answer sheet will be issued.

### **SECTION-A**

#### **(Long Answer Type Questions)**

**Note :** Section 'A' contains Five (05) long answer type questions of Nine and Half ( $9\frac{1}{2}$ ) marks each. Learners are required to answer any Two (02) questions only.  
( $2 \times 9\frac{1}{2} = 19$ )

1. Define the Langford-Gray mechanism for the substitution reaction in octahedral complexes.

2. What is trans effect and trans effecting series. Explain the trans effect by polarization theory and  $\pi$  bonding theory.
3. Compare the stability of following pair of complexes :
  - (a)  $[\text{Co}(\text{en})_3]^{+3}$  and  $[\text{Co}(\text{NH}_3)_6]^{+3}$  ions
  - (b)  $[\text{Fe}(\text{CN})_6]^{-4}$  and  $[\text{FeCl}_6]^{-4}$  ions
  - (c)  $[\text{Mn}(\text{H}_2\text{O})_6]^{+2}$  and  $[\text{Mn}(\text{NH}_3)_6]^{+2}$  ions
4. Discuss the bonding in terminal as well as bridging metal carbonyl by using the suitable examples.
5. Discuss the mechanism for hydrogenation of alkene by using Wilkinson catalyst.

## SECTION-B

### (Short Answer Type Questions)

**Note :** Section 'B' contains Eight (08) short answer type questions of Four (04) marks each. Learners are required to answer any Four (04) questions only. (4×4=16)

1. Explain the mechanism for substitution reaction in square planer complexes.
2. Discuss the oxidation of olefins by using Wacker's process.

3. What is chelating effect? Explain why chelating complexes being more stable than the non-chelating complexes.
  4. Discuss the stepwise and overall formation method for complexes.
  5. Define the structure of  $\text{Co}_2(\text{CO})_8$  in solid state.
  6. Explain metal halide clusters with the help of suitable examples.
  7. Define the acid hydrolysis in octahedral complexes and factor affecting the acid hydrolysis.
  8. Define the labile complexes in term of VBT.
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