Seat No. _____

HC-003-1104016

M. Sc. (Sem. IV) Examination

April - 2023

Inorganic Chemistry : CI-404

(Coordination Chemistry)

Faculty Code : 003

Subject Code : 1104016

Time : $2\frac{1}{2}$ / Total Marks : **70**

Instructions :

(1) Answer all questions.

(2) All questions carry equal marks.

1 Answer the following : (any seven) **14**

(a) Give Associative mechanism for nucleophilic substitution reaction in octahedral metal complexes.

(b) Give the reaction pathway for conversion of trans-$[Co(en)_2cl_2]$ to cis-$[Co(en)_2Cl_2]$

(c) Explain isomerism reactions of aquo and hydroxo complexes of cobalt.

(d) Discuss complementary two electron transfer reaction with example.

(e) Define formation function and fraction of complex formation.

(f) Discuss theories of trans effect.

(g) Give principle of jobs method.

(h) What do you mean by stability of complex ?

(i) On which principle of Mole ratio method works ?

(j) Name different methods to determine stability constant.

2 Answer the following : **14**

(a) Explain the trans effect with suitable example. Explain the outer sphere electron transfer reaction in coordination compound.

(b) Give an account of ligand substitution reaction with suitable example.

3 Answer the following : (any two) **14**

(a) What is stability ? Define stepwise and overall stability constant and obtain the reaction between them.

(b) Discuss Vosburgh and copper correction to the Job's method.

(c) Discuss half integral method to obtain the stepwise stability constant for ML_2 system.

(d) Explain Molecular Rearrangement process proceeds by SN^1 mechanism.

4 Answer the following : **14**

(a) Explain Correction Method.

(b) Explain the replacement mechanism of coordinate water in octahedral complex.

5 Answer the following : **14**

(a) Discuss the base hydrolysis of octahedral complexes of Co(ii) in solution, highlighting the importance of various factors which control and affect the reaction rate.

(b) Discuss job's method of continuous variation when more than one complex is present in solution.

OR

(a) Explain slop ration method. **14**

(b) Write about acid catalyzed reaction in octahedral complex with suitable example.
