# M. Sc. (Sem. IV) Examination

March - 2022

## C(I)-404 : Inorganic Chemistry

*(Coordination Chemistry)*

**Faculty Code : 003**
**Subject Code : 1104016**

Time : $2\frac{1}{2}$ Hours]                                      [Total Marks : **70**

**Instructions :** (1)  Answer all questions.
               (2)  All questions carry equal marks.

**1**   Answer the following (Any Seven)                                 **14**
 (a)  Give the principle of Mole ratio method.
 (b)  Give the reaction pathway for conversion of trans-$[Co(en)_2Cl_2]$ to cis$[Co(en)_2Cl_2]$.
 (c)  Explain isomeriam 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)  Give Associative mechanism for nucleophilic substitution reaction in octahedral metal complexes.
 (j)  Name different methods to determine stability constant.

**2**   Answer the following : (Any Two)                                 **14**
 (a)  Explain Correction method.
 (b)  Discuss Vosburgh and Copper correction to the Job's method.
 (c)  What is stability? Define step wise and overall stability constant and obtain the reaction between them.

**3** Answer the following : (Any Two)  **14**

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

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

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

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

**4** Answer the following :  **14**

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

    (b) Explain Bjerrum's-formation-functions.

**5** Explain the replacement mechanism of coordinate water in octahedral complex.  **14**

<div align="center"><b>OR</b></div>

**5** Discuss the Laboratory method for pH titration technique to find out the Stepwise stability constant.  **14**

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