6. (a) What are electron transfer reactions ? Give a brief account of the mechanism in one electron transfer reaction. **7**

(b) Give an account of the mechanism of substitution reaction in square planar complexes. **5**

(c) Starting from $[PtCl_4]^{2-}$ and other ligand outline the synthesis of cis and trans $[PtCl_2(NH_3)(C_2H_4)]$. **3**

Unit IV

7. (a) What is stability ? Give relationship between stepwise stability constant and overall stability constant. **7**

(b) What are various factors which affect the stability of metal ion complexes ? Explain. **5**

(c) Discuss trends in stepwise constants. **3**

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M. Sc. EXAMINATION, May 2019

(First Semester)

(C Scheme) (Re-appear)

CHEMISTRY

CH501C

Inorganic Chemistry–I

(Essential Inorganic Chemistry–I)

Time : 3 *Hours*] [*Maximum Marks :* 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) Write a short note on spinels, mentioning the definitions, structure and classification. **6**

(b) Define Jahn Teller theorem. Explain why in six co-ordinate complexes the distortion is more if the electron is in e_g in comparison to t_{2g} orbital. **6**

(c) Give the limitations of Crystal Field Theory. **3**

2. (a) Discuss and draw the molecular orbital diagram for octahedral complex $[Co(NH_3)_6]^{3+}$. **5**

(b) What do you mean by splitting of d orbitals ? Explain this splitting in tetrahedral and square planar field. **8**

(c) Discuss the geometry of $[Co(NH_3)_6]^{3+}$ on the basis of valence bond theory. **2**

Unit II

3. (a) What are inert and labile complexes ? Explain with suitable examples. **5**

(b) Explain in detail the factors affecting the acid and base hydrolysis. Also explain the conjugate base mechanism. **10**

4. (a) Explain in detail the kinetics of octahedral substitution. **10**

(b) Write short note on Anation reaction. **5**

Unit III

5. (a) What is trans effect ? Discuss the various theories of trans effect. **10**

(b) Give the mechanism of the following reaction : **10**

$$[Co(NH_3)_5Cl]^{2+} + [Cr(H_2O)_6]^{2+} \longrightarrow [Co(H_2O)_6]^{2+} + [Cr(NH_3)_5Cl]^{2+}$$

8. (a) What are binary formation constants ? Determine these with the help of pH-metery. **6**

(b) What is bent rule ? Explain. **4**

(c) Explain VSEPR theory with the help of suitable examples. **5**

8. (a) What are binary formation constants ? Determine these with the help of pH-metery. **6**

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(c) Explain VSEPR theory with the help of suitable examples. **5**