(b) Discuss the applications of magnetochemistry in determining the structure of metal complexes. **8**

(c) Explain the relationship between magnetic susceptibility and magnetic moment. **4**

Unit III

5. (a) Discuss its mechanism and the various factors which affect the rate constant of simple acid hydrolysis reaction. **12**

(b) Explain with example how the substitution reaction takes place in octahedral complexes without the rupture of metal ligand bond. **8**

6. Explain the detail inert and labile complexes with at least two examples of each. What do you mean by reactivity of metal complexes ?

20

BB-291

M. Sc. EXAMINATION, Dec. 2018

(Second Semester)

(Re-appear Only)

CHEMISTRY

CH502B

Inorganic Chemistry-II

(Coordination Chemistry)

Time : 3 *Hours*]　　　　　[*Maximum Marks :* 100

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 *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) Draw and discuss the combined energy level for d^1, d^4, d^6 and d^9 complexes in octahedral and tetrahedral field. **10**

(b) Derive the ground electronic state term symbols for free and coordinated metal ion in $[VX_4]^{2-}$ and $[CoY_6]^{3+}$, where x and y are monodentate anionic (having unit charge) and neutral ligands respectively. **6**

(c) What do you mean by spin orbit coupling ? Explain. **4**

2. (a) Using orgel diagram for an octahedral V(III) complex, describe the determination of value of dq and b parameters. **10**

(b) Elaborate all the d electron transitions found in the spectra of $[Co(CNS)_4]^{2-}$ ion. **10**

Unit II

3. (a) Define the following terms : **9**

(i) Magnetic moment

(ii) Intensity of magnetization

(iii) Magnetic susceptibility.

(b) Predict the value of spin magnetic moment for $[Mn(H_2O)_6]^{2+}$ and $[Fe(CN)_6]^{4-}$. **3**

(c) Discuss the phenomenon of orbital contribution to magnetic moment. Give electronic configuration in which orbital contribution is quenched. **8**

4. (a) Magnetic measurements on $CuSO_4.5H_2O$ at 293 K using a Gouy's balance gave valve of volume susceptibility 1.7×10^{-4}. The molecular weight and density are 250 and 2.29 g/cm^3. Calculate magnetic moment by ignoring small diamagnetic contribution. **8**

Unit IV

7. (a) Explain in detail the mechanism in one electron transfer reactions. **15**

   (b) How will you prepare the various isomers of $[PtCl(NH_3)Br(NO_2)]$ starting from $[PtCl_4]^{2-}$? **5**

8. Discuss inner sphere and outer sphere mechanism by suitable examples. **20**