MCHT 2.1

II Semester M.Sc Degree Examination, Jan 2016

CHEMISTRY

Inorganic Chemistry-II

Time: 3Hours Max. Marks: 80

PART-I

1. *Answer **any eight** questions* (2 x 8 = 16)

i) Why Pr^{IV} is not stable in aqueous solution?

ii) Which actinide isotopes can be obtained in macroscopic amounts?

iii) Vanadium hexacarbonyl is paramagnetic in nature, give reason

iv) What are dinitrogen complexes? Give one example.

v) Write the IUPAC name and structure of $[Cr(en)_2(CN)_2]F_2$ complex.

vi) What are ambidantate ligands? Give one example.

vii) What is polarizing effect? How it influences the stability constant of complex?

viii) What is Irwing-William series?

ix) Why CN^- and CO are referred as strong ligand?

x) What is ferro and antiferro magnetism?

PART-II

*Answer **any four** questions*

2. a) Discuss Manetic and spectral properties of Lanthanide complexes.

b) Briefly explain the variable oxidation states and their stability of actinide series.

c) Discuss the structure and magnetic properties of $[Fe(CO)_5]$ compound.

(4 + 6 + 6 = 16)

3. d) What are inner orbital and outer orbital complexes? Give one example each.

e) Whit example explain the substitution reaction of co-ordination compound in aqueous medium.

f) Explain the geometrical isomerism in tetrahedral and square planar complexes.

(4 + 6 + 6 = 16)

4. g) What is thermodynamic and kinetic stability of complexes? How geometry of the complex affect the stability?

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h) Using VBT discuss the structure and magnetic property of $[CoF_6]^{3-}$ complex ion.

i) What are low spin and high spin complexes? Illustrate with suitable example.

(4 + 6 + 6 = 16)

5. j) Discuss the effects of π-bonding on the value of Δo?

   k) Draw the molecular orbital diagram of tetrahedral complex.

   l) What are term symble? Calculate the d^{1-5} ions ground terms.

(4 + 6 + 6 = 16)

6. m) Discuss the structure and bonding in dihydrogen complexes.

   n) What are ligands? How are they classified? Give one example each.

   o) What is Trans effect? Explain the trans directing series with suitable examples.

(4 + 6 + 6 = 16)

7. p) Explain the dsp^2 hybridization in co-ordination compounds with example.

   q) What of the following complex is paramagnetic? Give reason.

   $[Fe(CN)_6]^{4-}$ and $[Sc(NH_3)_6]^{3+}$

   r) In what way are Tanabe-sugano diagrams different from Orgel diagrams? Illustrate with suitable example.

(4 + 6 + 6 = 16)