DCB – 510 (App.Che)

M.Sc. Final (Applied Chemistry) Degree Examination, July/August 2011
(Directorate of Distance Education)
DEC.APP.CHEM – 2.01 : ADVANCED INORGANIC CHEMISTRY

Time : 3 Hours Max. Marks : 80/85

Note : *1) Answer **any ELEVEN** questions from Part – **A** and **any FOUR** questions from Part – **B** and **any TWO** questions from Part – **C**.*

*2) Figures to the **right** indicate marks.*

PART – A

Answer **any ELEVEN** questions : **(11×2=22)**

1. a) Bring out the limitations of Valence Bond Theory.

   b) Explain the term Bohr effect.

   c) How is Zeise's salt obtained ?

   d) Distinguish between labile and inert complexes.

   e) Define crystal field stabilization energy.

   f) What are the differences between ferromagnetism and antiferromagnetism ?

   g) What do you understand by bonding and antibonding molecular orbitals ?

   h) Write the reaction scheme of water gas shift reaction.

   i) Explain outer sphere electron transfer reaction with example.

   j) What are the symptoms of copper toxicity ? How is it treated ?

P.T.O.

k) What are cryptands ?

l) Mention the natural oxygen carriers other than Hemoglobin and Myoglobin.

m) What is Heterogenous catalysis ? Give an example.

n) Give reason : Hexamine Cobalt (III) can be prepared in presence of activated charcoal.

o) What are oxidative addition and reductive eliminations ?

PART – B

Answer **any FOUR** of the following questions : **(4×8=32)**

2. Discuss the mechanism of hydrogenation of alkene by Wilkinson's catalyst.

3. Give the methods of preparation of ferrocene. Discuss its structure and bonding.

4. Discuss the factors which affect the magnitude of d-orbital splitting in octahedral complex.

5. Write the role of Na^+ and K^+ ions in biological system. Explain the working mechanism of Na^+/K^+/pump with diagram.

6. Set up M.O. diagram of $[CoF_6]^{3-}$ ion involving sigma bonding.

7. Write the reaction of Fischer-Tropics reaction with mechanism.

PART – C

Answer **any TWO** of the following questions : **(2×13=26)**

7. a) Discuss SN_1 reaction of complexes.

   b) Write a note on John-teller effect. **(5+8)**

8. a) With neat diagram, explain d-orbital splitting in octahedral and square planar complexes.

   b) Write a note on Ferridoxins and rubredoxins. **(5+8)**

9. a) Discuss the functions of Hemoglobin and Myoglobin.

   b) Describe the alkene hydroformulation employing octa carbonyl dicobaltate catalyst with mechanism. **(5+8)**

10. a) Write the role of cytochrome P-450 in biological systems.

    b) Explain Zeigler Natta polymerization processes. What significant role thus a catalyst play in the processes ? **(5+8)**

(**Compulsory** question for 85 marks scheme only)

Answer **any ONE** of the following question :

11. What is nitrogen fixation ? How does nitrogenous enzyme fix nitrogen in biological system ?

    OR

    Write a note on Ferrocene. **(05)**

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