LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**B.Sc.** DEGREE EXAMINATION – **CHEMISTRY**

SIXTH SEMESTER – APRIL 2011

# CH 6607/CH 6601 - COORDINATION CHEMISTRY

Date : 07-04-2011 Dept. No. Max. : 100 Marks

Time : 9:00 - 12:00

**PART –A**

**Answer ALL the questions (10 x 2=20)**

1. What is the role of catalase in nitrogen fixation?
2. Calculate CFSE value for Mn2+.
3. What are noncomplementary electron transfer reactions?
4. Explain outer sphere mechanism with an example.
5. What is Trans effect? Give an example.
6. Give an example of metal phthalocyanin involving metal template synthesis.
7. State Jahn Teller Theorem.
8. Draw the structure of Ni(CO)4
9. Mention the advantages of chelate therapy.
10. What are coenzymes? Give an example.

**PART –B**

**Answer any EIGHT questions (8 x 5 =40)**

1. Describe with a neat diagram crystal field splitting of metal d-orbitals in tetrahedral field.

12. Explain the polymerization of olefins using Ziegler Natta catalyst.

13. Explain photo substitution reactions with a suitable example.

14. Discuss the mechanism of inner sphere electron transfer reaction with a suitable example.

15. What is the significance of contrast agents in MRI? Give two examples.

16. Discuss the theories of Trans effect.

17. Explain metal template synthesis of Schiff bases with suitable examples.

18. Describe bonding in Fe3(CO)12

19. Explain the mechanism of alkene hydrogenation.

20. Write a note on photoisomerisation reactions.

21. Discuss the biological role of carboxypeptidase and catalases.

22. What are the experimental evidences for metal-ligand overlapping?

**PART –C**

**Answer any FOUR questions (4 x 10 = 40)**

23. a. Construct MO energy level diagram for [Co (NH3)6]2+

b. Explain crystal field splitting of metal d-orbitals in octahedral complexes.

24. a. Discuss the structure and bonding of ferrocene.

b. Explain dissociative mechanism of ligand substitution reaction in octahedral

complexes.

25. a. Explain cis effect with two examples.

b. Describe the metal template synthesis of Schiff bases

26. a. Write briefly on in vivo and in vitro nitrogen fixation.

b. Draw the structure of a. Fe(CO)5  b. Mn2(CO)10.

27. a. Explain 18 –electron rule with any two examples

b. Construct Metal orbitals and LGO’s suitable for σ and П bonding in octahedral

geometry.

28. a. Write a note on the following

a. hydrogenation reaction c. hydroformylation reaction.

b. photoredox reactions d. Photoisiomerizations reactions.

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