



**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**

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

**SIXTH SEMESTER – APRIL 2016**

**CH 6607/CH 6601 – COORDINATION CHEMISTRY**

**(UPTO 11-BATCH)**

Date: 18-04-2016

Dept. No.

Max. : 100 Marks

Time: 09:00-12:00

**PART-A**

Answer **ALL** the questions:

(10x2= 20 Marks)

1. State Jahn Teller theorem.
2. What is meant by hyperfine splitting in complexes?
3. What is non-complementary electron transfer reaction?
4. What is Trans effect? Give an example.
5. What are metal carbonyls? Give two examples.
6. Define CFSE.
7. What is nitrogen Fixation? What enzyme is useful for this process?
8. Draw the structure of  $\text{Fe}_2(\text{CO})_9$ .
9. What is 18 electron rule in metal complexes? Give an example.
10. What is meant by chelate therapy? Mention its advantages.

**PART-B**

Answer any **EIGHT** questions:

(8x5=40 marks)

11. What are the drawbacks in Crystal field Theory?
12. Explain the factors affecting crystal field stabilization energy. Explain with an example.
13. Describe the crystal field splitting of 'd' orbitals in octahedral complexes.
14. Explain the mechanism of inner sphere electron transfer reaction with an example.
15. Discuss the dissociative mechanism of ligand substitution reaction in octahedral complexes.
16. Discuss the polarization theory of Trans effect.
17. How will you prepare Schiff's base by template synthesis.
18. Explain the cis effect with an example.
19. What is Zeigler-Natta catalyst? How is it formed?
20. What are the defects in catalyst in hydroformylation of olefins? How are they eliminated?
21. Explain the biological role of carboxypeptidase and catalases?
22. Discuss the lability and inertness of complexes based on Taube's explanation. Give an example.

**PART-C**

Answer any **FOUR** questions:

(4x10= 40 marks)

23. (a) Construct the MO diagram for  $\text{CoF}_6$  based on MO theory. (5)  
(b) Explain the crystal field splitting of metal d-orbitals in tetrahedral complexes. (5)
24. (a) What are the postulates of crystal field theory? (5)  
(b) Discuss the associative mechanism of ligand substitution reaction in octahedral complexes. (5)
25. (a) Write a note on photosubstitution. (5)  
(b) Explain the mechanism of outer-sphere electron transfer reaction with an example. (5)
26. Discuss the different theories proposed for explaining the Trans effect.
27. (a) What is Wilkinson's catalyst? What is the role of the metal in Wilkinson catalyst? (5)  
(b) Write the mechanism of hydrogenation of olefins using Wilkinson's catalyst. (5)
28. (a) What is the significance of contrast agent in MRI? Give two examples. (5)  
(b) Write the structure of Peroxidases. What is its biological importance? (5)

\$\$\$\$\$\$