This question paper contains 2 printed pages.

4331

Your Roll No.....

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M.Tech. / Sem. VI

CHEMICAL SYNTHESIS AND PROCESS TECHNOLOGIES
Paper - Module 29 : Organometallic and Bioinorganic Chemistry
(N.C. Admissions of 2008 and onwards)

Time : 2hours *Maximum Marks :38*

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt all questions.

1. (a) Explain Dewar-Chatt-Duncanson model of bonding in the transition metal alkene complexes.

or 5

Explain the electron flow in Photosystem I and II.

(b) i. Comment if $Mo(CO)_7$ is likely to be stable or not. 2

ii. The reduction potential of Rieske FeS centres is strongly pH dependent unlike the standard FeS centres that have only thiolate ligation. Explain. 3

2. Attempt any two questions of the following: 5 x 2

(a) Write a short note on:
(i) Vaska complex
(ii) Isolobal fragments

(b) Explain the mechanism of action of cisplatin - DNA interactions.

(c) Discuss the structure and bonding in ferrocene.

3. (a) Explain the position of ν CO (cm^{-1}) in the observed IR spectra of the following. 2

$Ti(CO)_6^{2-}$	1748
$Cr(CO)_6$	2000
$Fe(CO)_6^{2+}$	2204

(b) Discuss the role of Mg^{2+} and Ca^{2+} ions in biological systems. 2

(c) Write a note on toxic effect of excess intake of metals on human body. 3

(d) Why Co based macrocyclic complex is well suited for radical base rearrangement? 3

4. Attempt any four questions. 4 x 2

(a) Why zinc metal ion is more acidic in carbonic anhydrase than in carboxypeptidase?

(b) Why are small Fe-porphyrin complexes unable to bind oxygen reversibly?

(c) What is the main function of cytochromes?

(d) Why blue copper proteins are intense in colour?

(e) Why chlorophyll show the low energy electronic transitions?