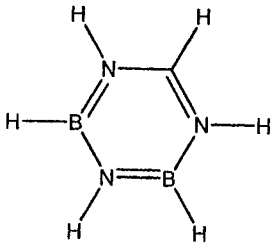
Uva Wellassa University, Sri Lanka
End Semester Examination – June 2009
CHE 341-2 Advanced Inorganic Chemistry

Time: Two (02) hours

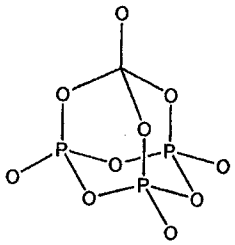
Total 05 Questions
Answer **four (04)** questions only
Question **01** is compulsory

01) Assign point groups for the following molecules.

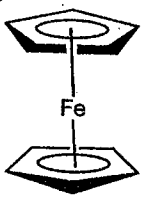
I. Borazine



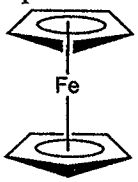
II. P_4O_{10}



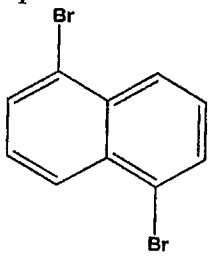
III. Ferrocene, staggered



IV. Ferrocene, eclipsed



V. 1,5-dibromonaphthalene



(40 marks)

02) I. Draw steriographic projections of the following point groups.

a. C_{6h}
b. D_{3h}
c. C_{4V}
d. D_4

(16 marks)

II. What is an Abelian group?

(04 marks)

03) I. Write the IUPAC name for the following organometallic compounds

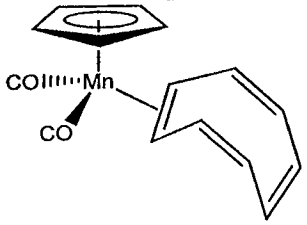
a. $[ReO_3(Me)]$

b. $[Cr(\eta^3 - C_3H_5)_3]$

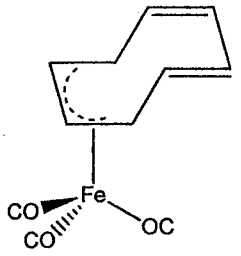
(04 marks)

II. Determine the haptocity of the organic ligands in the following complexes

a.



b.



(04 marks)

III. What are the valence electron counts of the organometallic complexes given in part II.

(04 marks)

IV. What are the coordinate modes of nitric oxide in organometallic complexes? Briefly explain.

(06 marks)

V. Give two industrial uses of organometallic compounds

(02 marks)

04) I. a. Classify silicates according to their arrangement of SiO_4^{2-} tetrahedra in space.

b. Draw the structures of any three types of silicates you mentioned in part a.

(10 marks)

II. a. Give three types of sheet silicates(phyllo-silicate).

b. Compare and contrast the structures of kaolinite and phyrophyllite.

(10 marks)

05) I. a. What are boranes? Briefly explain the nature of bonding in the hydrogen bridge in boranes.

b. According to the structure of borane they can be classified into four groups. Name three of them.

(08 marks)

III. Determine the valence electron count and draw the structures of the following boranes.

a. B_5H_9

b. B_5H_{11}

(12 marks)