



EASTERN UNIVERSITY, SRI LANKA  
FIRST SEMESTER THIRD EXAMINATION IN SCIENCE

SPECIAL - REPEAT

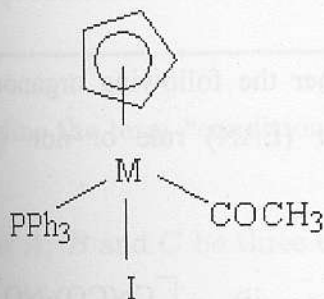
2007/2008(Dec.2008)

CH 305 ORGANOMETALLIC CHEMISTRY & NON - AQUEOUS  
SOLVENTS

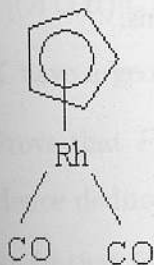
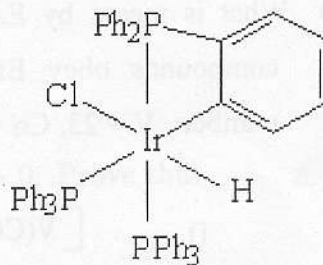
Time: 01 Hour

Answer all questions

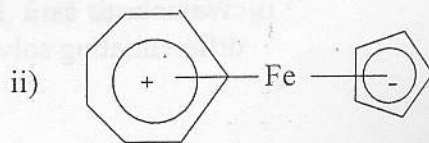
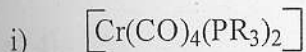
1. a) Indicate the monohapto, dihapto, trihapto; tetrahapto, pentahapto and bridging ligands present in the following compounds



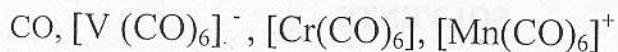
iv)



- b) Give the systematic names of the following organometallic compounds.

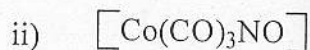
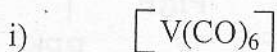


c) i) Arrange the following compounds in the order of increasing stretching frequency of the C-O bond. Account for your arrangement.



ii) A diamagnetic organometallic compound **P** having molecular formula  $\text{Co}_2(\text{CO})_8$  shows strong absorption at  $2000\text{ cm}^{-1}$  and  $1805\text{ cm}^{-1}$  in the region where CO stretching frequencies are observed. The  $^{13}\text{C}$  nmr spectrum of **P** consist of two signals of relative intensity 1(singlet): 3(singlet). Deduce the structure of **P**.

2. a) What is meant by EAN rule? Indicate whether the following organometallic compounds obey Effective Atomic Number (EAN) rule or not. (Atomic number: V = 23, Co = 27, Fe = 26, Cr = 24)



b) Give balanced chemical equations for the following reactions.

i.  $\text{SbF}_5$  in HF.

ii.  $\text{H}_2\text{SO}_4$  in  $\text{C}_2\text{H}_5\text{OH}$ .

c) Explain the following with appropriate reasons.

i. Acetic acid behaves as a weak acid in aqueous solution but shows strong acidic property in liq.  $\text{NH}_3$ .

ii. Water acts as a leveling solvent for strong acids whereas liq.  $\text{NH}_3$  act as differentiating solvent