



CRAWFORD UNIVERSITY
COLLEGE OF NATURAL AND APPLIED SCIENCES
DEPARTMENT OF EARTH AND PHYSICAL SCIENCE
INDUSTRIAL CHEMISTRY UNIT
RAIN SEMESTER EXAMINATION 2012/2013 SESSION

COURSE CODE: CHM 420

COURSE TITLE: ORGANOMETALLIC CHEMISTRY

TIME ALLOWED: 2 HOUR

DATE: JUNE, 2013

INSTRUCTIONS: Attempt any four (4) questions only.

2 UNITS

- Define the term 'Hapticity'.
 - Give examples of ligands with haptic number of 2, 3 and 4.
 - Describe the structure and bonding nature of ferrocene.
 - What are the observed exceptions to the 18 electron rule?
- What is Effective Atomic Number?
 - Show whether the complexes listed below obey the 18 electron rule.
 - $[\square - \text{Fe}(\text{CO})_2(\text{NO})]^+$
 - $[\text{C}_6\text{H}_6 - \text{Mo}(\text{CO})_3]^+$
 - $\text{V}(\text{CO})_6$
 - Account for the reactions of Ferrocene.
- What are the major roles played by organometallic compounds in catalysis?
 - Describe the stages involved in the homogeneous catalysis by organometallic compounds in hydrogenation of alkenes using the Wilkinson's catalyst.
- Describe the Hydroformylation of alkenes via the 'oxo-process'.
 - Explain the valence electron count in polynuclear complexes.
- What are the major techniques in characterization of organometallic complexes?
 - Show the necessary steps in the counting of valence electrons in organometallic complexes.