



# TECHNICAL UNIVERSITY OF MOMBASA

---

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PURE & APPLIED SCIENCES

UNIVERSITY EXAMINATION FOR:

MASTER OF SCIENCE

ACH 5106: ADVANCED ORGANOMETALLIC AND COORDINATION  
CHEMISTRY

**Special/Supplementary Examinations**

**SERIES: SEPTEMBER 2018**

**TIME: 3HOURS**

**DATE: Pick Date Sep2018**

**Instructions to Candidates**

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **SIX** Question(s). Attempt any **FOUR** questions.

**Do not write on the question paper.**

---

**Question ONE**

- (a) What is the importance of Organometallic Chemistry? **(5 marks)**
- (b) With the aid of diagrams describe:
  - (i) The Cativa processes. **(10 marks)**
  - (ii) Suzuki coupling. **(10 marks)**

**Question TWO**

- (a) Write down equations for the following Homogenous Catalysis reactions:
  - (i) Wacker Process oxidation
  - (ii) Monsanto acetic acid synthesis
  - (iii) Ziegler-Natta Polymerization**(1 mark each)**
  
- (b) List Alkene/Olefin Metathesis Reaction types.

**(9 marks)**

(c) What is a transition metal carbene complex? **(3 marks)**

(d) With the aid of diagrams, describe:

(i) Fischer carbenes (5 marks)

(ii) Schrock carbenes (5 marks)

### **Question THREE**

Describe the participation of the p orbitals in cyclopentadienyl and the 3d orbitals of iron(II) in the bonding in ferrocene. **(25 marks)**

### **Question FOUR**

With the aid of diagrams describe bonding and structure in Alkene complexes. **(25 marks)**

### **Question FIVE**

(a) Write notes on Heterogeneous Catalysis and Homogeneous Catalysis **(10 marks)**

(b) Describe

(i) Cross metathesis

(ii) Ring-closing metathesis

(iii) Ring-opening metathesis

**(5marks each)**

### **Question SIX**

Write succinct notes on Carbon monoxide with respect to:

(a) Its industrial importance. (12 marks)

(b) Metal-Carbonyl synthesis. (13 marks)