



# MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)

University Examinations 2015/2016

SCHOOL OF AGRICULTURE AND NATURAL RESOURCES MANAGEMENT

DEPARTMENT OF ENVIRONMENTAL STUDIES

SECOND SEMESTER EXAMINATION FOR DEGREE IN BACHELOR OF SCIENCE  
IN ENVIRONMENTAL RESOURCE CONSERVATION

ERC 107: INTRODUCTION TO AGROECOSYSTEMS AND NATURAL RESOURCES

Date: 21/4/2016

Time: 8:30 – 10:30 AM

---

## INSTRUCTIONS

*This paper consists of FIVE questions*

*Answer question one and other two questions in this paper*

1. (a) Explain the following terms as applied in agroecosystems
  - i. Agro-ecosystems (2 marks)
  - ii. Soil organic matter. (2 marks)
  - iii. Hygroscopic water. (2 marks)
  - iv. Habitat conservation (2 marks)
  - v. Agro-biodiversity. (2 marks)
- (b) Explain five (5) mechanisms that are used to improve agroecosystems immunity. (5 marks)
- (c) Explain any five (5) principles of sustainable agroecosystems (5 marks)
- (d) Differentiate between natural ecosystems and agroecosystems (4 marks)

- (e) Explain how the rate of soil formation is influenced by the following.
- i. Parent material (2 marks)
  - ii. Climate (2 marks)
  - iii. Topography (2 marks)
2. (a) By use of a diagram, illustrate the four components of an ideal soil matrix (4 marks)
- (b) Explain the three factors that influence Cation Exchange Capacity. (6 marks)
- (c) Explain five (5) functions of soil organic matter (SOM) (10 marks)
3. (a) Explain four (4) soil inherent constraints in agroecosystems. (8 marks)
- (b) Explain three advantages and disadvantages each of zero tillage farming in agro ecosystems. (6 marks)
- (c) Explain three main anthropogenic sources of greenhouse gases in Kenya (6 marks)
4. (a) Explain five (5) characteristics of healthy and high-quality soils. (8 marks)
- (b) Explain the three main categories of soil quality indicators: (6 marks)
- (c) Discuss the two main components of biodiversity in agro ecosystems. (6 marks)
- 5 (a) Explain two (2) effects of soil quality on rangelands (2 marks)
- (b) Discuss the causes of habitat loss in agroecosystems in Kenya (10 marks)
- (c) Discuss four (4) farm management practices that can be used to improve agro-biodiversity. (8 marks)