



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**SCHOOL OF AGRICULTURAL AND FOOD SCIENCES**

**FIRST YEAR SECOND SEMESTER EXAMINATIONS FOR THE DEGREE OF**  
**BACHELOR OF SCIENCE IN FOOD SECURITY 2013/2014 ACADEMIC YEAR**

**AFB 3123: ECOLOGY**

**Instructions:**

1. This paper consists of **TWO** sections, **A** and **B**.
2. Answer **ALL** questions from section **A** and any **TWO** from section **B**.
3. Write all answers in the booklet provided.

**SECTION A [30 MARKS]**

**Answer ALL questions from Section A.**

1. (a) Explain, giving examples, the terms autotrophs and heterotrophs. [2 marks]  
(b) Illustrate schematically, how biotic and abiotic components of an ecosystem combine to form biosystems. [4 marks]  
(c) Using illustrations, describe in ecological context, the terms:  
(i) Food chain, [2 marks]  
(ii) Food web. [2 marks]
2. (a) Explain the nexus between climate change and global warming. [3 marks]  
(b) State and explain any three mitigating strategies to climate change. [2 marks]  
(c) Present and briefly explain a trophic classification of living organisms. [5 marks]
3. (a) Identify and describe the two types of receptors that detect temperature changes in the mammalian body. [3 marks]  
(b) State and explain the main components of a negative feedback mechanism. [3 marks]  
(c) What is an ecological pyramid? Describe the three main ecological pyramids. [4 marks]

**SECTION B [40 MARKS]**

**Answer ANY TWO questions from Section B.**

4. (a) Discuss the mechanisms through which mammalian body respond to heat and cold. [12 marks]  
(b) Discuss briefly the principle of Growing Day Degree and its use in agriculture. [8 marks]
5. (a) Discuss the factors that regulate population size in an ecosystem. [10 marks]  
(b) Present a graphical model depicting the major ecosystem components and their interrelationships. [10 marks]
6. (a) Comment briefly on the following terms, give examples:  
i) Abiotic components of an ecosystem. [4 marks]  
ii) Ecology and civilization. [3 marks]  
iii) Biological resources. [3 marks]  
(b) Discuss briefly, the principle of energy and matter flow in an ecosystem. [10 marks]