



# MACHAKOS UNIVERSITY

University Examinations 2018/2019

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FOURTH YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF EDUCATION (SCIENCE)

BACHELOR OF ENVIRONMENTAL SCIENCES

ERC 407: BIOLOGICAL CONTROL

DATE: 26/7/2019

TIME: 2.0-4.00 PM

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## INSTRUCTIONS

1. Answer Question 1 (compulsory) and **any two** questions in Section B.
2. Use clean well labelled diagrams wherever appropriate.

## SECTION A

### Question 1. –

- a) Define the term biological control and highlight at least three economic characteristics of Biological controls (3 marks)
- b) Briefly describe three features of highly effective biological controls (3 marks)
- c) Highlight the positive and negative aspects on the use of Fishes and Bacteria as agents of Biological control giving an examples in each case (3 marks)
- d) Briefly explain how conservation and biodiversity can be used in Biological controls (3 marks)
- e) Using case histories List some of the past mistakes in biological control that can be used to predict the future of biocontrol (3 marks)
- f) Distinguish between Cross protection and induced resistance as methods in biological control (3 marks)
- g) Name any six Biological information required for vector control (3 marks)
- h) Describe the pathosystem concept that leads to “damage (3 marks)
- i) Distinguish between Pest Injury versus pest Damage (3 marks)
- j) Draw a graph of a working concept that leads to pest damage of the plant (3 marks)

- k) Define the following terminologies in the context of ecosystem Organization and Succession (3 marks)
- a) Population
  - b) Guild
  - c) Community

## **SECTION B**

### **QUESTION TWO**

You have just been employed by the National environmental Management Authority to draft a document containing how you will measure environmental impacts and minimise the risks / benefits of biocontrol. Please evaluate your salient points (20 marks)

### **QUESTION THREE**

Discuss any known genetically engineered agent of biological control (20 marks)

### **QUESTION FOUR**

Discuss in detail the agricultural, environmental and medical benefits of Biological control (20 marks)