



MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF AGRICULTURAL SCIENCES

DEPARTMENT OF AGRICULTURAL EDUCATION AND EXTENSION

FOURTH YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE IN AGRICULTURAL EDUCATION AND EXTENSION

AGR 452: PRINCIPLES OF ORGANIC FARMING AND CONSERVATION

AGRICULTURE

DATE: 19/10/2020

TIME: 2.00-4.00 PM

INSTRUCTIONS:

Answer **ALL** questions from Section A and **ANY TWO** from Section B

SECTION A: COMPULSORY: (30 MARKS)

QUESTION ONE (30 MARKS)

- a) Differentiate the following terms
 - i. Commensalism and mutualism (3 marks)
 - ii. Volatilization and denitrification (3 marks)
 - iii. Agronomic efficiency and recovery efficiency (3 marks)
- b) Explain **THREE** major problems associated with the use of green manures (6 marks)
- c) Using a diagrammatic illustration, describe the relationship between yield response, nutrient rate and nutrient use efficiency (6 marks)
- d) Explain the contribution of mixed farming systems to environmental sustainability (6 marks)
- e) Explain **THREE** advantages of converting to organic production system (3 marks)

SECTION B: Answer any **TWO** questions (40 Marks)

QUESTION TWO (20 MARKS)

- a) Analyse **FIVE** potential benefits of using biological control as a pest control method in organic production systems (10 marks)
- b) Explain the **THREE** principles of conservation agriculture (10 marks)

QUESTION THREE (20 MARKS)

- a) As a farmer who has decided to practice organic farming, describe **FIVE** strategies that will help you to achieve a balance between optimal nutrient use efficiency and optimal crop productivity (10 marks)
- b) Based on the key principles of crop rotation, describe a **FIVE-CROP** crop rotation program that you can utilize in an organic farming system (10 marks)

QUESTION FOUR (20 MARKS)

- a) Explain **FIVE** potential disadvantages of practicing conservation tillage in organic farming (10 marks)
- b) Explain the **FOUR** principles that govern organic agriculture (10 marks)

QUESTION FIVE (20 MARKS)

- a) Explain the concept of Biological Nutrient Fixation (BNF) as used in organic production systems (10 marks)
- b) Explain **FIVE** constraints of practicing integrated crop-livestock farming systems (10 marks)