



MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF AGRICULTURAL SCIENCES

DEPARTMENT OF AGRICULTURAL EDUCATION AND EXTENSION

FOURTH YEAR SPECIAL/ SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE IN AGRIBUSINESS MANAGEMENT AND TRADE AND

BACHELOR OF EDUCATION SCIENCE

**AGR 452/AGR422: PRINCIPLES OF ORGANIC FARMING AND CONSERVATION
AGRICULTURE**

DATE: 22/01/2021

TIME: 8.30-10.30 AM

INSTRUCTIONS:

Answer *ALL* questions from Section A and any other *TWO* from Section B:

SECTION A: COMPULSORY: (30 MARKS)

QUESTION ONE

- a) Differentiate between the following terms
 - i) Commensalism and parasitism (3 marks)
 - ii) Partial factor productivity and partial nutrient budget (3 marks)
 - iii) Agronomic efficiency and recovery efficiency (3 marks)
- b) Explain **THREE** problems associated with the use of green manures (6 marks)
- c) Explain **THREE** disadvantages of converting to organic production system from the conventional production systems (3 marks)
- d) Explain **FIVE** benefits of practicing conservation tillage in organic farming (5 marks)
- e) Explain **FOUR** benefits of using biological control as a pest control method in organic production systems (4 marks)
- f) Explain the concept of crop rotation as an important tool in the success of organic systems (3 marks)

SECTION B: Answer any TWO questions (40 Marks)

QUESTION TWO

- a) Using a diagrammatic illustration, describe the relationship between yield response, nutrient rate and nutrient use efficiency (10 marks)
- b) Describe the concept of Biological Nutrient Fixation (BNF) as used in organic production systems (10 marks)

QUESTION THREE

- a) A farmer decides to practice organic farming, describe **FIVE** strategies that will help achieve a balance between optimal nutrient use efficiency and optimal crop productivity (10 marks)
- b) Using an illustration, explain **THREE** pathways that contribute to Nitrogen nutrient losses (10 marks)

QUESTION FOUR

- a) Discuss the contribution of mixed farming systems to environmental sustainability (10 marks)
- b) Discuss **FIVE** constraints of practicing integrated crop-livestock farming systems (10 marks)

QUESTION FIVE

- a) “Organic agriculture has the potential to secure a global food supply with reduced environmental impact” Discuss. (10 marks)
- b) Explain the **FOUR** principles of conservation agriculture (10 marks)