



MACHAKOS UNIVERSITY

University Examinations for 2021/2022 Academic Year

SCHOOL OF AGRICULTURAL SCIENCES

DEPARTMENT OF AGRICULTURAL EDUCATION AND EXTENSION

FOURTH YEAR SECOND SEMESTER EXAMINATION

BACHELOR OF SCIENCE (AGRICULTURAL EDUCATION AND EXTENSION)

BACHELOR OF EDUCATION (SPECIAL NEEDS)

BACHELOR OF EDUCATION (SCIENCE)

AGR 422: PRINCIPLES OF ORGANIC FARMING AND CONSERVATION

AGRICULTURE

DATE: 8/12/2021

TIME: 8.30-10.30 AM

INSTRUCTION TO CANDIDATES: Answer ALL questions from Section A and any other TWO from Section B:

SECTION A: COMPULSORY: (30 MARKS)

QUESTION ONE

- a) Distinguish between the following terms
 - i. Organic and conservation agriculture (2 marks)
 - ii. Permaculture and biodynamic agriculture (2 marks)
 - iii. Agronomic efficiency and physiological efficiency (2 marks)
- b) Explain four pillars in sustainability of organic agriculture (4 marks)
- c) Explain four benefits a farmer stands to gain by adopting organic farming (2 marks)
- d) Explain four reasons why farmers are hesitant in adopting mulching as a practice in conservation agriculture (2 marks)
- e) Explain three limitations in each of the following cropping systems in a conservation agriculture
 - i. Intercropping (3 marks)
 - ii. Silvopasture (3 marks)

- f) Citing specific two examples in each case, explain three principles of conservation agriculture in sustainable farming systems (6 marks)
- g) Explain four principles of organic agriculture that are key to its success in Kenya (4 marks)

SECTION B: ANSWER ANY TWO QUESTIONS (40 MARKS)

QUESTION TWO (20 MARKS)

- a) Citing specific examples, explain five environmentally sustainable strategies in crop protection (10 marks)
- b) Discuss five solutions adapted by farmers during converting from conventional farming to organic and conservation agriculture (10 marks)

QUESTION THREE (20 MARKS)

Explain five roles in each of the following cropping systems in sustainability of organic and conservation agriculture

- a) Multiple cropping (5 marks)
- b) Agroforestry (5 marks)
- c) Mixed farming (5 marks)
- d) Urban and peri-urban farming (5 marks)

QUESTION FOUR (20 MARKS)

- a) Explain five factors that affect nutrient use efficiency in crop production (10 marks)
- b) Explain five benefits of adopting crop – livestock systems by farmers (10 marks)

QUESTION FIVE (20 MARKS)

- a) Describe the three crucial historical steps in development of organic agriculture. (12 marks)
- b) Explain four challenges faced by farmers in certification of organic crop farming. (8 marks)