



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

**FIRST YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF
MASTER OF SCIENCE IN FOOD SECURITY AND SUSTAINABLE
AGRICULTURE.**

2024/2025 ACADEMIC YEAR

COURSE CODE: AFB 5127

COURSE TITLE: Innovations for Sustainable Food Systems

DATE: **STREAM:** MSc. (Food Security and Sustainable
Agriculture)

TIME: 3 Hours

Instructions:

1. Answer **THREE** Questions.
2. Question 1 is compulsory.
3. All questions carry equal marks.

Question 1

Evaluate the role of technological innovations such as precision agriculture, biotechnology, AI in improving food security and sustainability. What challenges and ethical issues arise from these technologies, especially in developing countries or marginalized communities? Provide examples. (20

Marks)

Question 2

Discuss how circular economy principles, such as food waste reduction, upcycling, and sustainable packaging, contribute to a sustainable food supply chain. How do these innovations perform in both developed and developing countries. (20

Marks)

Question 3

How can innovations in food systems promote social equity, particularly for marginalized groups like women and smallholder farmers? Discuss both technological and policy solutions. (20

Marks)

Question 4

Compare alternative proteins (plant-based, insect-based, lab-grown) in terms of their environmental, economic, and social impacts. What limitations do these alternatives face in achieving widespread adoption? (20 Marks)

Question 5

How do global food system governance frameworks (e.g., SDGs, UN Food Systems Summit) influence national food policies? What challenges do governments face in aligning policies with food security and sustainability goals, especially in low-resource settings?

(20 Marks)