



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

**SPECIAL EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN
HORTICULTURE AND ANIMAL SCIENCE
2019/2020 ACADEMIC YEAR**

RESIT EXAMINATION

COURSE CODE: AAB 3424

COURSE TITLE: GMOs, Biosafety and Bioethics

EXAM VENUE:

STREAMS: BSc. Horticulture and Animal Science

DATE:

EXAM SESSION:

TIME: 2 HOURS

Instructions:

- 1. Answer ALL questions in section A and ANY other 2 Questions in section B.**
- 2. Candidates are advised not to write on question paper.**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room.**

Answer all questions in Section A and Two questions in Section B

SECTION A [30MARKS]

1. (a) Define the following terminologies
 - I. Recombinant DNA technology [1 mark]
 - II. Transgenic Organisms [1 mark]
 - III. Intellectual property right. [1 mark]
2. Explain why GMOs are created [4 mks]
3. Using examples differentiate between the following
 - (a) Biosafety and Bioethics [2 marks]
 - (b) Trademark and copyright [2 marks]
4. (a) What is a biohazard? [2 marks]
 - (c) State and explain the four different levels of biocontainment laboratories [4marks]
5. Genes that seem to be of much interest to public and private sectors in agriculture are those that confer resistance to biotic and abiotic stresses as well as quality traits.
 - a. Using BT maize as an example, briefly discuss the above statement. [4 mark]
 - b. Enumerate **two** examples where biotechnology is used to improve agricultural produce quality. [4 marks]
6. State four Good laboratory practices that should be observed when working in a biotechnology laboratory. [4 marks]

SECTION B [40 MARKS]

7. Formulate guidelines which should be adopted by the Department of Biotechnology, Govt. of Kenya to ensure sound science and ethical principle. [20 marks]
8. Describe in details how genetically modified organisms are developed and their significance in the global food systems [20marks]
9. Discuss the relevance of intellectual property rights to modern biotechnology [20 marks]
10. Explain the challenges facing modern biotechnology research and application in Kenya [20marks]