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ABT 102



(University of Choice)

**MASINDE MULIRO UNIVERSITY OF SCIENCE AND  
TECHNOLOGY  
MAIN CAMPUS**

**UNIVERSITY EXAMINATIONS  
2023/2024 ACADEMIC YEAR  
(MAIN EXAM)**

**FOURTH YEAR SECOND SEMESTER EXAMINATIONS  
FOR THE DEGREE  
OF  
BACHELOR OF SCIENCE IN AGRICULTURE AND  
BIOTECHNOLOGY**

**COURSE CODE: ABT 102**

**COURSE TITLE: INTRODUCTION TO BIOTECHNOLOGY**

**DATE: 13.12.23**

**TIME: 3-5 PM**

**INSTRUCTIONS TO CANDIDATES**

**Answer all the questions in section A and any TWO Questions in Section B**

*MMUST OBSERVES ZERO TOLERANCE TO EXAMINATION CHEATING*

**SECTION A: ANSWER ALL QUESTIONS (30 MARKS)**

**QUESTION ONE**

- a. One concern regarding GM foods is that pesticide-resistant plants could lead to weeds and insects that are resistant as well. How might this occur? **(4 marks)**
- b. Scientists use restriction enzymes isolated from bacteria for DNA cloning. Explain how bacteria prevent restriction enzymes from dicing up their DNA. **(4 marks)**
- c. Define the following terms.
- i. Tissue culture **(2 marks)**
  - ii. Biotechnology **(2 marks)**
  - iii. Somatic hybridization **(2 marks)**
  - iv. Mutagenesis **(2 marks)**
- d. You are working as a forensic scientist and have a DNA sample from the crime scene and samples from three suspects. Describe how you would determine the guilty suspect using this evidence. **(5 marks)**
- e. You have been working on cloning the gene you study into a cloning vector and think you finally have it. You ramp up the production of the recombinant DNA in *E. coli* and isolate the DNA. What mechanisms can you use to ensure that the plasmid you have isolated from your bacteria is what you expect? **(4 marks)**
- f. Outline the basic tools used in Recombinant DNA technology **(5 marks)**

**SECTION B: ANSWER ANY TWO QUESTIONS (40 MARKS)**

**QUESTION TWO**

Discuss the components of tissue culture media (20 marks)

**QUESTION THREE**

Discuss five different methods of cell transformation (20 marks)

**QUESTION FOUR**

Discuss the challenges and opportunities facing the use of biotechnology in agriculture. (20 marks)

**QUESTION FIVE**

Discuss the application of biotechnology in:

- i. Environment (5 marks)
- ii. Medicine (5 marks)
- iii. Agriculture (5 marks)
- iv. Industry (5 marks)

