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*(Knowledge for Development)*

**KIBABII UNIVERSITY**  
**UNIVERSITY EXAMINATIONS**  
**2022/2023 ACADEMIC YEAR**  
**SECOND YEAR FIRST SEMESTER**  
**MAIN EXAMINATION**

**FOR THE DEGREE OF BACHELOR OF SCIENCE IN AGRICULTURE  
AND BIOTECHNOLOGY**

**COURSE CODE: ABI 211**  
**COURSE TITLE: INTRODUCTION TO BIOTECHNOLOGY**  
**DATE 19<sup>TH</sup> DECEMBER 2022 TIME: 2 – 4 PM**

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**INSTRUCTIONS TO CANDIDATES**

**Answer Question ONE and any other TWO Questions.**

**TIME: 2 Hours**

**This paper consists of 3 printed pages. Please Turn Over**



**KIBU observes ZERO tolerance to examination cheating**

## 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. Give specific advantages of clonal propagation **(5 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 **(4 marks)**
- ii. Medicine **(4 marks)**
- iii. Agriculture **(4 marks)**
- iv. Industry **(4 marks)**
- v. Forensics **(4 marks)**