



(Knowledge for Development)

# **KIBABII UNIVERSITY**

**UNIVERSITY EXAMINATIONS**

**2022/2023 ACADEMIC YEAR**

**THIRD YEAR SECOND SEMESTER**

**SUPPLEMENTARY EXAMINATION**

**FOR THE DEGREE OF BACHELOR OF SCIENCE**

**COURSE CODE: ABI 323**

**COURSE TITLE: BIOTECHNOLOGY AND CROP IMPROVEMENT**

**DATE: 10<sup>TH</sup> AUGUST 2023**

**TIME: 8 – 10 AM**

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## **INSTRUCTIONS TO CANDIDATES**

Answer Question One and Any other TWO (2) Questions

TIME: 2 Hours

This Paper Consists of 2 Printed Pages. Please Turn Over. 

**QUESTION ONE (COMPULSORY)****(30 MKS)**

- a) Define the following terms in relation to plant biotechnology and crop improvement;
- i. Genetic engineering (4 MKS)
  - ii. Phenotype (3 MKS)
  - iii. Clone (2 MKS)
  - iv. Gene (3 MKS)
  - v. Gene expression (2 MKS)
  - vi. Transgenic organism (2 MKS)
- b) Describe briefly how molecular markers have been used in crop improvement. (4 MKS)
- c) Outline any two factors that influence the success of genetic engineering (4 MKS)
- d) Differentiate between DNA and RNA (6 MKS)

**QUESTION TWO**

Analyze Genetically Engineered Crops (GE Crops) under the following topics;

- a) Environmental impacts of Genetically Engineered Crops (10 MKS)
- b) Economic effects of Genetically Engineered Crops (10 MKS)

**QUESTION THREE**

- a) Describe the following kinds of gene transfer methods in plants
  - i. Vector-mediated or indirect gene transfer (5 MKS)
  - ii. Vectorless or direct gene transfer (10 MKS)
- b) Differentiate between traditional plant breeding and Genetic Engineering (5 MKS)

**QUESTION FOUR**

Using examples of Genetically Engineered Crops being grown, give an account of how biotechnology has been applied towards genetic improvement of crops. (20 MKS)

**QUESTION FIVE**

- a) As an agricultural Biotechnology expert, discuss whether or not we should adopt Genetic Engineering of Crops. (10 MKS)
- b) Outline any five advantages of Genetically Engineered Crops (10 MKS)