



(Knowledge for Development)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS

2022/2023 ACADEMIC YEAR

THIRD YEAR SECOND SEMESTER

MAIN EXAMINATION

FOR THE DEGREE OF BACHELOR OF SCIENCE IN
AGRICULTURE AND BIOTECHNOLOGY

COURSE CODE: ABI 323

COURSE TITLE: BIOTECHNOLOGY AND CROP IMPROVEMENT

DATE: 18TH APRIL 2023

TIME: 9 – 11 AM

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. 

KIBU observes ZERO tolerance to examination cheating

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

- a) List any TWO properties of a Genetic code (2 MKS)
- b) Outline any TWO functions of the following structures and organelles of a cell;
 - i. Chromatin (2 MKS)
 - ii. Cytoplasm (2 MKS)
 - iii. Centrioles (2 MKS)
 - iv. Golgi bodies (2 MKS)
- c) Differentiate between DNA and RNA (10 MKS)
- d) Outline any TWO activities that occur under the following steps in cell division;
 - i. Metaphase of Meiosis I (2 MKS)
 - ii. Metaphase of Meiosis II (2 MKS)
 - iii. Anaphase of Meiosis I (2 MKS)
- e) Describe the following terminologies as applied in agricultural biotechnology;
 - i. Gene silencing (2 MKS)
 - ii. Gene flow (2 MKS)

QUESTION TWO

- a) Outline any FOUR properties of DNA carrier vectors (8 MKS)
- b) Describe the FOUR major steps in the Polymerase Chain Reaction process (12 MKS)

QUESTION THREE

Using diagrams, describe the process of meiosis II. (20 MKS)

QUESTION FOUR

- a. Describe any FOUR types of vectors used in gene transfer (8 MKS)
- b. Discuss the activities that occur during the following processes of cell division;
 - i. Leptotene (3 MKS)
 - ii. Zygotene (3 MKS)
 - iii. Pachytene (3 MKS)
 - iv. Diplotene (3 MKS)

QUESTION FIVE

Discuss the Central Dogma Concept (20 MKS)