



(Knowledge for Development)

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KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS

2019/2020 ACADEMIC YEAR

SECOND YEAR SECOND SEMESTER

SUPPLEMENTARY EXAMINATION

FOR THE DEGREE OF BACHELOR OF SCIENCE IN
AGRICULTURE AND BIOTECHNOLOGY

COURSE CODE: SAB 232

COURSE TITLE: BIOTECHNOLOGY AND CROP IMPROVEMENT

DATE: 10/02/2021.

TIME: 8-10 AM.

INSTRUCTIONS TO CANDIDATES

Answer Question One in Section A and Any other TWO (2) Questions in Section B

TIME: 2 Hours

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

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SECTION A: Answer All Questions (COMPULSORY) (30 MKS)

QUESTION ONE

- a) Outline the functions of the following structures and organelles of a cell;
- i. Cell membrane (2 MKS)
 - ii. Cell wall (2 MKS)
 - iii. Cytoplasm (2 MKS)
 - iv. Golgi bodies (2 MKS)
 - v. Mitochondrion (2 MKS)
- b) State any two objectives of Genetic Engineering (2 MKS)
- c) Outline the advantages and disadvantages of Genetically Engineered crops for delayed fruit ripening. (8 MKS)
- d) Explain how the following have been applied in agricultural biotechnology (2 MKS)
- i. Tissue culture (2 MKS)
 - ii. Embryo rescue (2 MKS)
 - iii. Somatic hybridization (2 MKS)
 - iv. Genetic engineering (2 MKS)
 - v. Molecular markers (2 MKS)

SECTION B: Answer ANY Two Questions (40 MKS)

QUESTION TWO

- a) Analyze Environmental impacts of Genetically Engineered Crops (10 MKS)
- b) Differentiate between traditional plant breeding and Genetic Engineering (5 MKS)
- c) Identify and list the factors that influence the success of genetic engineering (5 MKS)

QUESTION THREE

- a) As an agricultural Biotechnology expert, discuss whether or not we should adopt Genetic Engineering of Crops. (10 MKS)
- b) Briefly describe the following terms in relation to protein synthesis; (5 MKS)
- i. Transcription (5 MKS)
 - ii. Translation

QUESTION FOUR

- a) Analyze Economic impacts of Genetically Engineered Crops (10 MKS)
- b) Briefly describe the following Vectorless or direct gene transfer methods:
- i. Chemical mediated gene transfer (2 MKS)
 - ii. Microinjection (2 MKS)
 - iii. Electroporation (2 MKS)
 - iv. Particle gun/Particle bombardment (2 MKS)
 - v. Liposome mediated gene transfer or Lipofection (2 MKS)

QUESTION FIVE

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

-GOOD LUCK-

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