JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF AGRICULTURAL AND FOOD SCIENCES

FOURTH YEAR SECOND SEMESTER UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN FOOD SECURITY

2017/2018 ACADEMIC YEAR

REGULAR

COURSE CODE: AFB 3426

COURSE TITLE: BIOTECHNOLOGY IN AGRICULTURE

EXAM VENUE: **STREAM: BSc. (Food Security)**

DATE: **EXAM SESSION:**

TIME: 2 HOURS

Instructions:

1. **Answer ALL questions in section A and ANY other 2 Questions in section B.**
2. **Candidates are advised not to write on question paper.**
3. **Candidates must hand in their answer booklets to the invigilator while in the examination room.**

SECTION A   [30 MARKS]

1. Outline three disadvantages of tissue culture technology   (3 marks)

2. Identify the main steps involved in molecular cloning using recombinant technology   (4 Marks)

3. Describe three main enzymes involved in recombinant DNA technology   (3 marks)

4. Using a well labeled diagram, draw a plasmid vector map and describe its features (4 marks)

5. Identify three advantages of using molecular markers in plant breeding programmes (3 marks)

6. Define the term protoplast fusion and differentiate between spontaneous and induced fusion (3 marks)

7. Outline three current advances in plant and animal biotechnology   (3 marks)

8. Name and describe three commercial recombinant food/ medical applications of genetically engineered products and give the organism used to produce that product**.**   (3 Marks)

9. Describe how a gene library is made   (4 Marks)

SECTION B   [40 MARKS]

Answer ANY TWO questions from this Section.

1. Discuss five genetic engineering techniques used in the manipulation and study of DNA.   (20 Marks)

2. Describe all the steps involved in gene cloning. Draw a flow chart showing the processes involved.

3. Define the term molecular marker and discuss the various types polymerase chain reaction (PCR) based molecular markers used in plant breeding.   (20 marks)

4. Discuss the industrial and agricultural application of Biotechnology   (20 Marks)