MACHAKOS UNIVERSITY

University Examinations for 2018/2019 Academic Year

SCHOOL OF AGRICULTURAL SCIENCES

DEPARTMENT OF AGRICULTURAL EDUCATION AND EXTENSION

……. YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE IN AGRICULTURAL EDUCATION AND EXTENSION

SBT 450: AGRICULTURAL BIOTECHNOLOGY

DATE: **TIME:**

INSTRUCTIONS;

Answer *ALL* questions from Section A and any other *TWO* from Section B:

SECTION A: COMPULSORY: (30 MARKS)

QUESTION ONE

a) What are the nucleic acids (1 mark)

b) Describe the following:-

i. Components of RNA molecule (3 marks)

ii. The three types of RNA and their functions (3 marks)

c) i State the two types of chromosomes (1 mark)

ii Explain the functions of Chromosomes (2 marks)

d) State applications of polymerase chain reaction (PCR) (3 marks)

e) Describe the following techniques, indicating the applications of each:

i. Gel electrophoresis (5 marks)

ii. Recombinant DNA technology (5 marks)

f) State the Important biological tools used in recombinant DNA technology (4 marks)

g) Describe the DNA ligases applied in biotechnology (3 marks)

SECTION B: ANSWER ANY TWO QUESTIONS (40 MARKS)

QUESTION TWO (20 MARKS)

a) Describe the restriction enzymes applied in biotechnology (10 marks)

b) Describe the requirements and steps involved in polymerase chain reactions (10 marks)

QUESTION THREE (20 MARKS)

a) Discuss the central Dogma in molecular biology (10 marks)

b) Describe the process of recombinant DNA technology (10 marks)

QUESTION FOUR (20 MARKS)

a) Discuss the applications of biotechnology in Agriculture (10 marks)

b) Discuss the molecular markers used in biotechnology (10 marks)

QUESTION FIVE (20 MARKS)

a) Discuss the media components of plant tissue/cell culture (15 marks)

b) Describe the protoplast fusion techniques (5 marks)