

**W1-2-60-1-6**

**JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY**

**UNIVERSITY EXAMINATIONS 2019/2020**

**THIRD YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF DEGREE OF BACHELOR OF SCIENCE IN BIOTECHNOLOGY AND PLANT ECOLOGY AND ENVIRONMENTAL SCIENCES**

**SBT 2308: ADVANCED GENETICS**

**DATE: DECEMBER, 2019 TIME: 2 HOURS**

INSTRUCTIONS: ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

**QUESTION ONE: 30 MARKS**

a. Differentiate the following terms:-

 i. Quantitative and qualitative traits. (2 marks)

 ii. Episomes and plasmids. (2 marks)

 iii. Partial dominance and over dominance. (2 marks)

b. Outline eight significance of plasmids in bacteria genetics. (4 marks)

c. Explain the connection between DNA and an organism’s traits. (3 marks)

d. Describe mechanisms of gene transfer in bacteria. (6 marks)

e. Outline the principles of inheritance for quantitative traits. (6 marks)

f. Describe how heritability is used in breeding programs. (5 marks)

**QUESTION TWO: 20 MARKS**

Discuss factors affecting the Hardy-Weinberg equilibrium.

**QUESTION THREE: 20 MARKS**

Discuss mutations and their consequences.

**QUESTION FOUR: 20 MARKS**

Discuss gene action.