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**JOMO KENYATTA UNIVERSITY**

**OF**

**AGRICULTURE AND TECHNOLOGY**

**UNIVERSITY EXAMINATIONS 2020/2021**

 **THIRD YEAR FIRST SEMESTER EXAMINATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE IN BIOTECHNOLOGY**

**SBT 2308: ADVANCED GENETICS**

**DATE: MAY 2021 TIME: 2 HOURS**

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

**QUESTION ONE (30 MARKS)**

1. Define the following terms;
2. Epistasis (1 mark)
3. Qualitative traits (1 mark)
4. Episomes (1 mark)
5. Partial dominance (1 mark)
6. Modifying genes (1 mark)
7. In a certain human population, the frequency of dwarf individuals is 1 in 10,000

Considering albinism is due to a recessive gene, calculate:

1. The frequency of the recessive and normal alleles. (3 marks)
2. The frequency of the genotypes in that population at equilibrium. (2 marks)
3. Outline FOUR causes of variation in gene action. (4 marks)
4. Describe the composition of viral genome. (5 marks)
5. Describe the concept of gene therapy. (5 marks)
6. Describe three mechanisms of bacterial sexing. (6 marks)

**QUESTION TWO (20 MARKS)**

Discuss Fredrick Griffith’s experiment of genetic transformation

**QUESTION THREE (20 MARKS)**

Discuss mutations and their consequences

**QUESTION FOUR (20 MARKS)**

Discuss factors affecting the Hardy-Weinberg equilibrium