



**MASINDE MULIRO UNIVERSITY OF  
SCIENCE AND TECHNOLOGY  
(MMUST)**

**UNIVERSITY EXAMINATIONS**

**2021 / 2022 ACADEMIC YEAR**

**MAIN EXAMINATIONS  
MAIN CAMPUS**

**FIRST YEAR SECOND SEMESTER EXAMINATIONS**

**FOR THE DEGREE  
OF  
BACHELOR OF SCIENCE IN BIOCHEMISTRY,  
BIOTECHNOLOGY, BIOLOGY AND AGRICULTURAL  
BIOTECHNOLOGY**

**COURSE CODE: SBL 122**

**COURSE TITLE: GENETICS**

**DATE: THURSDAY, 21<sup>ST</sup> APRIL 2022**

**TIME: 12:00 – 2:00 P.M.**

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**INSTRUCTIONS TO CANDIDATES**

Answer ALL QUESTIONS in section A and ANY TWO selected from section B

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

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

**SECTION A (SHORT ANSWER QUESTIONS, 40 MARKS)**

1. Using an illustration highlight the characteristics of an oligogenic trait. (5 marks)
2. Distinguish between the objective of monohybrid and trihybrid genetic crosses' experiments. (4 marks)
3. Outline six scenarios in plants that may not require one to emasculate a bisexual flower to conduct genetic experiments. (6 marks)
4. Based on Mendel's laws of genetics explain the causes of variations among children of the same parents yet they are sourced from the same genetic pool. (5 marks)
5. Using case examples, explain why "catching the seed" is possible in some crops by farmers. (5 marks)
6. Calculate the purity/homozygosity levels of pureline at F11 of crossing and development. (5 marks)
7. Highlight the properties that made the pigeon peas (*Cajanus cajan*) a good subject of study by Mendel in genetics. (5 marks)
8. Explain why generation of a odd number of chromosomes in most species leads to infertility trait. (5 marks)

**SECTION B (ESSAY QUESTIONS, 30 MARKS)**

11. A couple are heterozygous to the balding gene. They are seeking genetic counselling services to show the likely inheritance patterns of their offsprings based on this trait. Using a punnet square demonstrate the pattern to the couple. (15 marks)
12. Using illustrations, discuss the chromosomal disorders that arise from aneuploidy state in humans. (15 marks)
13. Discuss the different types of traits based on the mode of expression. (15 marks)