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University Examinations 2022/2023

SECOND YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN AGRICULTURE AND BACHELOR OF SCIENCE IN AGRICULTURAL EXTENSION AND EDUCATION

SBT 3252: GENETIC AND CYTOGENETIC

DATE: APRIL 2023 **TIME: 2 HOURS**

INSTRUCTIONS: *Answer question **one** and any other **two** questions*

QUESTION ONE (30 MARKS)

a) Distinguish between the following;
   (i) Transmission genetics and population genetic
   (ii) Gene and Allele
   (iii) Genotype and phenotype (6 marks)

b) Outline any three (3) inheritance involving multiple alleles (3 marks)

c) Define linkage and explain how linkage interferes with independent assortment (3 marks)

d) State three factor that affect of crossing over (3 marks)

e) State three reasons why genetic mapping is important (3 marks)

f) In a survey of 1000 individuals, the following genotype distribution was reported AA=353; Aa=494; aa=153. Calculate the genotype and allele frequencies of the population (5 marks)

g) State any four qualities that make an organism suitable for genetic experimentation (4 marks)

h) Explain the term polypoidy and state two of its commercial applications in plants (4 marks)

QUESTION TWO (20 MARKS)

Discuss the various abberations in chromosome structure and their consequences in human (20 marks)

QUESTION THREE (20 MARKS)

Discuss sources of variation in crop and livestock and how these variations can be maintained to improve production (20 marks)

QUESTION FOUR (20 MARKS)

Discuss the major evolutionary forces that influence the distribution and frequencies of alleles in a population (20 marks)