



# MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

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University Examinations 2022/2023

SECOND YEAR SECOND SEMESTER SPECIAL/SUPPLEMENTARY EXAMINATION  
FOR THE DEGREE OF BACHELOR OF SCIENCE IN BIOCHEMISTRY

**SBT 3250: GENERAL GENETICS**

DATE: AUGUST 2023

TIME: 2 HOURS

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

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## QUESTION ONE (30 MARKS)

- a) Distinguish between the following:
- (i) Penetrance and expressivity
  - (ii) Linkage and crossing over
  - (iii) Genotype and phenotype (6 marks)
- b) Define linkage and explain how linkage interferes with independent assortment (3 marks)
- c) State three factors that affect crossing over (3 marks)
- d) State three reasons why genetic mapping is important (3 marks)
- e) In a survey of 1000, individuals, the following genotype distribution was reported  
AA=353; Aa=494; aa=153. Calculate the genotype and allele frequencies (5 marks)
- f) (i) Name the syndrome associated with the following conditions (3 marks)
- (i) Trisomy 13
  - (ii) Trisomy 18



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(iii) Trisomy 21

(ii) State the chromosome involved in each of the above cases. (3 marks)

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

**QUESTION TWO (20 MARKS)**

Discuss the various structural aberrations in chromosome and their consequences in human

**QUESTION THREE (20 MARKS)**

Discuss the evolutionary factors that cause changes in allele frequencies in population

**QUESTION FOUR (20 MARKS)**

Discuss the various systems of sex determination giving specific examples

