



*(Knowledge for Development)*

**KIBABII UNIVERSITY**  
**UNIVERSITY EXAMINATIONS**  
**2021 / 2022 ACADEMIC YEAR**

**FIRST YEAR FIRST SEMESTER**  
**SPECIAL/SUPPLEMENTARY EXAMINATIONS**

**FOR THE DEGREE OF BSC. BIOLOGY & BSC. AGRICULTURAL  
BIOTECHNOLOGY**

**COURSE CODE: SBT 123**

**COURSE TITLE: General Genetics and Evolution**

**DATE: 27<sup>TH</sup> JULY 2022**

**TIME: 8.00 – 10.00 AM**

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**INSTRUCTIONS TO CANDIDATES**

Answer Question one (1) and any other two (2) Questions. Question one is compulsory and carries 30 marks, the other Questions carry 20 marks each.

TIME: 2 Hours

This paper consists of 3 printed pages. Please Turn Over 

KIBU observes ZERO tolerance to examination cheating

### Question One

- a. State the Hardy-Weinberg equilibrium (3 marks).
- b. Differentiate between convergent and divergent evolution (4 marks).
- c. Define sex-linkage (2 marks).
- d. Give the main differences between Deoxyribonucleic acid and ribonucleic acid (5 marks).
- e. Define the following terms as used in genetics:
  - i. Transition (1 mark)
  - ii. Transversion (1 mark)
  - iii. Nucleotide (1 mark)
  - iv. Nucleoside (1 mark)
  - v. Mutation (1 mark)
- f. With the aid of examples differentiate between sexual and asexual reproduction (5 marks).
- g. What differentiates prokaryotic genomes from eukaryotic genomes? (4 marks).
- h. Which mutation causes human beings to respond differently to Lactose? (2 marks).

### Question Two

Discuss Mitosis and Meiosis highlighting its significance in inheritance (20 marks).

### Question Three

Explain how variation (both phenotypic and genotypic) comes about in living organisms. Use well labeled diagrams where applicable (20 marks).

### Question Four

Using relevant examples, discuss the genetic basis of disease (20 marks).

### **Question Five**

Discuss the following using relevant examples:

- i. Heterozygote advantage (10 marks)
- ii. Inbreeding depression (10 marks).