(*Knowledge for Development*)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS 2020/2021 ACADEMIC YEAR

SECOND YEAR FIRST SEMESTER SPECIAL/SUPPLEMENTARY EXAMINATIONS

FOR THE DEGREE OF BACHELORS' IN EDUCATION SCIENCE, BSC IN: BIOLOGY, BIORESOURCE CONSERVATION AND MANAGEMENT, AND AGRICULTURAL BIOTECHNOLOGY

COURSE CODE: **SBT 123**

COURSE TITLE: **GENERAL GENETICS**

DATE: MONDAY 27TH SEPTEMBER, 2021 **TIME:** 11:00-1:00 P.M.

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 2 printed pages. Please Turn Over

1. a) Provide short description to the following terms: (5 Marks)
   i. Complementation test.
   ii. Penetrance.
   iii. Epistasis.

   b) Describe the structure and interactions of the genetic elements that comprise the prokaryotic chromosome. (5 Marks)

   c) A genetic code is said to be both universal and degenerate. Explain the two concepts with relevant examples. (5 Marks)

   e) Distinguish between Autosomal Dominant Inheritance Patterns and the Autosomal Recessive Inheritance Patterns (5 Marks)

   f) Explain the courses of chromosomal aberrations (5 Marks)

   g) Briefly describe the concept of Nucleic acid hybridization (5 Marks)

2. Compare and contrast the strand directed DNA mismatch repair and the nucleotide excision repair. (20 Marks)

3. a) Discuss the roles of enzymes involved in DNA replication process (14 Marks)

   b) Two phenotypically wild-type fruit flies were crossed, resulting in 88 females and 43 male progeny. Provide a brief explanation of this result. (2 Marks)

   c) Briefly describe the principle of complementary base pairing (4 Marks)

4. a) Describe the types of mutations that result in exon skipping and outline theconsequences of such events. (10 Marks)
   b) Describe any three human genetic disorders (10 Marks)

5. a) Explain four main differences in translation in eukaryotes and the prokaryotes (8 Marks)

   b) Describe the prokaryotic transcription regulation (12 Marks)