(*Knowledge for Development*)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS 2020/2021 ACADEMIC YEAR

THIRD YEAR SECOND SEMESTER SUPPLEMENTARY EXAMINATIONS

FOR THE DEGREE OF BACHELOR OF EDUCATION SCIENCE AND BACHELOR OF SCIENCE

COURSE CODE: SBT 322

COURSE TITLE: PLANT EVOLUTION

DATE: 10TH JANUARY 2022 **TIME: 8.00 – 10.00 AM**

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

Question One

a. How are the genes and environment responsible for the expression of a particular trait? (5 marks).

b. Define these terms:

i. dominance (2 marks),

ii. co-dominance (2 marks),

iii. incomplete dominance (2 marks).

c. Mention the characteristics of a true breeding line (5 marks).

d. Define artificial selection. Does it have an effect the process of natural selection? (5 marks).

e. What is the difference between aneuploidy and polyploidy? (5 marks).

f. List any four branches of plant breeding (4 marks).

Question Two

a. A tall plant with red flowers (dominant) is crossed with a dwarf plant with white flowers (recessive). Work out a dihybrid cross and state the dihybrid ratio. What will be the effect on the dihybrid ratio if the two genes are interacting with each other? Use well labeled diagrams in your answer. (10 marks).

b. Supposing the tall plant with red flowers (dominant) in question (a) above was instead crossed with a tall plant with red flowers (co-dominant), what would be the dihybrid cross and ratio in this case? (10 marks).

Question Three

a. Define polyploidy (2 marks).

b. Explain the types of polyploidy (8 marks)

c. Discuss how polyploidy can lead to speciation (10 marks).

Question Four

a. What is hybridization as used in plant evolution? (2 marks).

b. What are the types of hybridization? (8 marks).

c. Discuss how hybridization and gene flow can lead to plant evolution or lack of it (10 marks).

Question Five

a. What is apomixis as used in plant evolution? (2 marks).

b. What are the types of apomixis? (8 marks).

c. Discuss apomixis can be used for crop improvement (10 marks).