(*Knowledge for Development*)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS 2020/2021 ACADEMIC YEAR

FOURTH YEAR FIRST SEMESTER MAIN EXAMINATIONS

FOR THE DEGREE OF BACHELOR OF SCIENCE IN AGRICULTURE AND BIOTECHNOLOGY

COURSE CODE: SBL 413

COURSE TITLE: PLANT CELL, TISSUE AND ORGANIC CULTURE

DATE: Wednesday 21st July, 2021. **TIME:** 8:00 – 10:00 a.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 3 printed pages. Please Turn Over

QUESTION ONE

a) Enumerate three advantages of micropropagation. (3 Marks)

b) State four characteristics of collenchyma cells. (4 Marks)

c) Outline four applications of cellular totipotency. (4 Marks)

d) Describe the structural composition of the apical meristem. (4 Marks)

e) What are gene banks? (3 Marks)

f) Describe the cells that make up the periderm. (4 Marks)

g) Enumerate four advantages of somatic embryogenesis (4 Marks)

h) Differentiate between the following terms:-

i. Explant and Callus (2 Marks)

ii. Simple tissues and Complex tissues (2 Marks)

QUESTION TWO

Tissue culture is an important tool in genetic engineering of plants and crop production. Justify this statement (20 Marks)

QUESTION THREE

a) Describe the cellular composition of the epidermis. (11 Marks)

b) Outline three roles in each of the listed plant organs:-

i. Roots (3 Marks)

ii. Stem (3 Marks)

iii. Leaves (3 Marks)

QUESTION FOUR

a) State and explain functions of the phloem. (8 Marks)

b) Describe four sterilization techniques in tissue culture. (12 Marks)

QUESTION FIVE

a) Enumerate four functions of Sclerenchyma cells. (4 Marks)

b) Write short notes on the following as related to Plant Tissue Culture:

i. The steps involved in hardening tissue culture plantlets. (4 Marks)

ii. The role of auxins and cytokinins. (4 Marks)

iii. Components of the growth media. (4 Marks)

iv. Sterilization of plant material and need for aseptic lab conditions (4 Marks)