MACHAKOS UNIVERSITY

University Examinations 2022/2023 academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FOURTH YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF EDUCATION

SBT 403: ECOPHYSIOLOGY

DATE: **TIME:**

INSTRUCTIONS

1. Anwer Question 1 (compulsory) and **any two** questions in Section B.
2. Use clean well labelled diagrams wherever appropriate.

SECTION A (COMPULSORY)

QUESTION ONE (30 MARKS)

a) Describe the following terms:

   i. Field capacity (1.5 marks)

   ii. Permanent wilting percentage (1.5 marks)

b) Describe two forces that contribute to the ascent of sap in plants (3 marks)

c) Describe the components of water potential in plants (3 marks)

d) Describe the mechanisms of salt tolerance exhibited by some halophytic plants (3 marks)

e)

   i. Explain mechanisms by which solar radiation penetrates leaf canopies (3 marks)

   ii. Describe two effects of solar energy on plants (2 marks)

f) Describe the stages of germination (4 marks)

g) Distinguish between Transpiration and guttation (2 marks)

h) Justify why biotechnologists are trying to genetically modify C3 plants to convert them to C4 or CAM plants. (2 marks)

i) Distinguish between production rate and production yield of dry matter (2 marks)

j) Describe oxidative phosphorylation (3 marks)

SECTION B

QUESTION TWO (20 MARKS)

Discuss how photosynthates are utilised by plants

QUESTION THREE (20 MARKS)

Describe the mechanisms of drought resistance exhibited by xerophytes

QUESTION FOUR (20 MARKS)

Describe the factors that result in seed dormancy

QUESTION FIVE (20 MARKS)

Discuss how phytohormones are involved in the stomatal response to stresses