



MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FOURTH YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF EDUCATION (SCIENCE)

SBT 403: ECOPHYSIOLOGY

DATE: 23/10/2020

TIME: 8:30 – 10:30 AM

INSTRUCTIONS

1. Answer 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 term field capacity (3 marks)
 - b) Describe the main components of water potential in plants (3 marks)
 - c) Explain the role of the following enzymes in plants:-
 - i) (Ribulose 1, 5 biphosphate caboxylase (1.5 marks)
 - ii) (Phosphoenol pyruvate carboxylase (1.5 marks)
 - d) Describe the mechanism of ascent of sap in plants (3 marks)
 - e) Differentiate between seed vigor and seed viability (3 marks)
 - f) Describe specialization of chloroplasts to the process of photosynthesis (3 marks)
 - g) Explain why chlorophyll A is the active centre in the photosynthetic process (3 marks)
 - h) Describe three mechanisms of drought physiology in plants (3 marks)
 - i) Describe oxidative phosphorylation in respiration (3 marks)
 - j) Explain why UV and Infra red radiations cannot be effective for physiological processes in plants (3 marks)
 - k) Briefly describe the following in plants:-
 - i) Physical dormancy (1.5 marks)
 - ii) Morphophysiological dormancy (1.5 marks)
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SECTION B: ANSWER ANY TWO QUESTIONS (40 MARKS)

QUESTION TWO (20 MARKS)

- (a) Compare transpiration and guttation (5 marks)
- (b) Discuss water and minerals absorption in plants (15 marks)

QUESTION THREE (20 MARKS)

Illustrate the cyclic and the non cyclic electron flow

QUESTION FOUR (20 MARKS)

Describe at ten mechanisms of salt tolerance in plants

QUESTION FIVE (20 MARKS)

Discuss factors that influence the opening and closing of stomata