



MACHAKOS UNIVERSITY

University Examinations for 2024/2025 Academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

THIRD YEAR FIRST SEMESTER EXAMINATION FOR DEGREE IN
BACHELOR OF EDUCATION (SCIENCE),
BACHELOR OF EDUCATION (SCIENCE/SPECIAL NEEDS)
BACHELOR OF SCIENCE IN BIOLOGY

SBT 309 : ADVANCED PLANT ECOLOGY

DATE: 15TH JANUARY, 2025

TIME: 11.00 AM – 1.00 PM

INSTRUCTIONS:

- Answer question **ONE (Compulsory)** and **any other TWO** questions
- Use clean well labelled diagrams wherever appropriate

QUESTION ONE (30 MARKS)

- Distinguish between density -dependent mortality and density- dependent fecundity factors in population regulation. (3 Marks)
- Using an example, describe amensalism. (3 Marks)
- Describe Hardin's competitive exclusion principle. (3 Marks)
- Describe the importance of species diversity indices in vegetation studies. (3 Marks)
- Briefly describe the relevance of remote sensing in vegetation analysis. (3 Marks)
- Explain how ordination techniques contribute to biodiversity assessments and conservation planning. (3 Marks)
- Briefly explain r-selected and k-selected species, giving an example in each case. (3 Marks)
- Briefly describe "Protective Mutualism". (3 Marks)
- Differentiate between scramble and contest competition. (3 Marks)

- j) Outline three types of niches in a natural habitat. (3 Marks)

QUESTION TWO (20 MARKS)

- a) Discuss Hutchinson's concept of niche overlap. (10 Marks)
b) Describe the plotless sampling methods as used in studying plant communities. (10 Marks)

QUESTION THREE (20 MARKS)

- a) Describe Yoda's self-thinning rule as used in plant population regulation. (10 Marks)
b) Describe five sampling designs used in vegetation ecology. (10 Marks)

QUESTION FOUR (20 MARKS)

- a) Critically analyze Gleason's Individualistic concept of plant communities. (12 Marks)
b) Using examples, describe four types of plant parasitism. (8 Marks)

QUESTION FIVE (20 MARKS)

- a) Explain the Braun-Blanquet approach to vegetation classification. (10 Marks)
b) Describe the steps followed in direct gradient analysis on a named landscape. (10 Marks)