



MACHAKOS UNIVERSITY

University Examinations for 2020/2021

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FOURTH YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (AGRICULTURAL EDUCATION AND EXTENSION)

SCB 407: BIODIVERSITY AND CONSERVATION BIOLOGY

DATE: 16/8/2021

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) Outline the levels of biological organization and spatial scales of biodiversity (3 marks)
- b) Describe the value of biodiversity in ecosystem service (4 marks)
- c) State the evolutionary processes that underpin patterns of biodiversity (3 marks)
- d) Describe the core indicators of the state of biodiversity (3 marks)
- e) Distinguish between adaptive divergence and habitat divergence as population genetics classifications of speciation mechanisms (4 marks)
- f) Describe briefly the two dimensions of climate change that drive biodiversity loss (3 marks)
- g) Describe the key considerations in the design of protected areas as units for *in situ* conservation (3 marks)
- h) Outline the three main components of species extinction. (3 marks)
- i) Contrast the effects of genetic drift and gene flow on local populations. (4 marks)

SECTION B: ANSWER ANY OTHER TWO QUESTIONS

QUESTION TWO (20 MARKS)

Discuss the ecological factors that influence patterns and processes of biodiversity.

QUESTION THREE (20 MARKS)

Discuss the response options for conserving biodiversity and promoting human well-being under the following categories

- a) Responses with a primary goal of conservation of biodiversity (10 marks)
- b) Responses with a primary goal of sustainable use of biodiversity (10 marks)

QUESTION FOUR (20 MARKS)

Describe the quantitative criteria for classifying taxa into extinction risk categories

QUESTION FIVE (20 MARKS)

Illustrate the interactions between biodiversity as a response variable affected by drivers and a factor modifying ecosystems.