



MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

THIRD YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (BIOLOGY)

SZL 312: LIMNOLOGY

DATE: 12/11/2020

TIME: 2:00 – 4:00 PM

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 significance of water movement in lakes (3 marks)
- b) Describe the effect of biological magnification in limnological systems (3 marks)
- c) Describe three (3) factors that cause currents in water bodies (3 marks)
- d) Illustrate a depth-light intensity profile and state 2 factors that explain the shape of the profile (4 marks)
- e) Outline 3 factors that affect light penetration in water bodies (3 marks)
- f) Some aquatic ecology students determined the depth - oxygen profile in two lakes (A and B). Lake A was located within a highly populated environment with lots of domestic, agricultural and industrial activities within its watershed. Lake B was located in a flat dry area with little rainfall, poor soils and hence scarce settlements and little human activities.
 - i) By use of diagrams, illustrate the likely depth-oxygen curves in lake A and B. (2 marks)
 - ii) Explain the shape of each curve (4 marks)

- g) Outline three items that constitute food for the Nekton of the profundal zone in a lake ecosystem (3 marks)
- h) Outline three adaptations for life in the pelagic waters (3 marks)
- i) Explain the significance of the thermocline in a lake ecosystem (2 marks)
- j) Explain why the numbers of organisms in mid water streams are higher compared to head water streams and down water streams (2 marks)

SECTION B: ANSWER ANY TWO QUESTIONS (40 MARKS)

QUESTION TWO (20 MARKS)

Discuss how waters' unique properties affect life in aquatic ecosystems

QUESTION THREE (20 MARKS)

Discuss the importance of the various ecological zones in a lentic system

QUESTION FOUR (20 MARKS)

Describe adaptations for life in lotic systems

QUESTION FIVE (20 MARKS)

Discuss thermal stratification in lakes