



# 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

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## 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