



MACHAKOS UNIVERSITY

University Examinations for 2024/2025 Academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FOURTH YEAR FIRST SEMESTER EXAMINATION FOR DEGREE IN
BACHELOR OF EDUCATION (SCIENCE)
BACHELOR OF EDUCATION (SPECIAL NEEDS)

SZL 409: ENVIRONMENTAL PHYSIOLOGY

DATE: 24TH JANUARY, 2025

TIME: 2.00 PM – 4.00 PM

INSTRUCTIONS:

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

QUESTION ONE (30 MARKS)

- Explain animal aestivation. (3 marks)
- Describe adaptations of animals to oxygen deficient water. (3 marks)
- Explain the physiological changes occurring in a hibernating animal. (3 marks)
- Explain how desert birds respond to temperature change. (3 marks)
- Describe the effects of Chlorofluorocarbons (CFCs) on stratospheric ozone layer. (3 marks)
- Illustrate three components of homeostatic control. (3 marks)
- Describe the animal response strategies to heat stress in an ecosystem. (3 marks)
- Distinguish between oviparity and viviparity. (3 marks)
- Explain the role of sweat in thermoregulation. (3 marks)
- Describe the significance of cellular respiration in animals. (3 marks)

QUESTION TWO (20 MARKS)

Discuss the adaptations of aquatic organisms to osmoregulation

QUESTION THREE (20 MARKS)

- a) Discuss the role of homeostasis in acid-base balance in the body. (12 marks)
- b) Describe how behavioral responses facilitate adaptation to the environment. (8 marks)

QUESTION FOUR (20 MARKS)

Describe the mechanisms of thermoregulation in aquatic poikilotherms.

QUESTION FIVE (20 MARKS)

Describe glomerular filtration process in a mammalian kidney.