



MACHAKOS UNIVERSITY

University Examinations for 2021/2022 Academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FOURTH YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF EDUCATION (SPECIAL NEEDS EDUCATION)

BACHELOR OF SCIENCE(BIOLOGY)

BACHELOR OF EDUCATION (SCIENCE)

SZL 409: ENVIRONMENTAL PHYSIOLOGY

DATE: 26/8/2022

TIME: 8.30-10.30 AM

INSTRUCTIONS

Answer question one and any other two questions

SECTION A

QUESTION ONE (COMPULSORY) (30 MARKS)

- a) Explain the evolutionary significance of homeostasis in animals (3 marks)
- b) Explain why respiration is more costly for aquatic animals (3 marks)
- c) Explain why most terrestrial animals are urotellic (3 marks)
- d) Differentiate between
 - i. Ultradian and Infradian rhythms (2 marks)
 - ii. Diapause and Quiescence (2 marks)
- e) Outline three effects of hypothermia in organisms (3 marks)
- f) Describe three circulatory adaptations for mountain climbing (3 marks)
- g) Describe three adaptations for aquatic feeding (3 marks)
- h) Describe three physiological adaptations in birds for efficient respiration in their environment (3 marks)
- i) Describe adenotrophic viviparity (3 marks)
- j) Outline two physiological changes in an animal during hibernation (2 marks)

SECTION B

QUESTION TWO (20 MARKS)

- a) Compare and contrast the challenges of an ectothermic and an endothermic life style. (10 marks)

b) Describe how animals have adapted to hyperthermic conditions in their environments.

(10 marks)

QUESTION THREE (20 MARKS)

Explain how aquatic animals deal with the following challenges in their environment:

a) Hypoxia

(10 marks)

b) Osmolality

(10 marks)

QUESTION FOUR (20 MARKS)

Discuss how animals have evolved to achieve reproductive success in their environments

QUESTION FIVE (20 MARKS)

Discuss mechanisms by which animals overcome migration challenges