



MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

SECOND YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (BIOLOGY)

BACHELOR OF EDUCATION (SCIENCE)

SZL 202: COMPARATIVE PHYSIOLOGY

DATE: 27/11/2020

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) Differentiate between
 - i) Ectotherms and Endotherms (2 marks)
 - ii) Sympathetic and parasympathetic nervous systems (2 marks)
- b) Explain two (2) feeding adaptations in
 - i) Spider (2 marks)
 - ii) Polychaete worms (2 marks)
- c) State two reasons why each of the following may not be suitable for a gazelle
 - i) Intracellular digestion (2 marks)
 - ii) Cutaneous respiration (2 marks)
- d) Explain how the following are adapted to their functions
 - i) Oesophagus (2 marks)
 - ii) Gills (2 marks)
- e) Describe non-shivering thermogenesis (3 marks)
- f) Give three (3) reasons that explain lack of vivipary in some animals (3 marks)
- g) Describe the annelid circulatory system (3 marks)
- h) Outline three (3) osmoregulatory adaptations in arthropods (3 marks)
- i) Outline two differences between avian and mammalian lungs (2 marks)

SECTION B: ANSWER ANY TWO QUESTIONS (40 MARKS)

QUESTION TWO (20 MARKS)

Describe how animals are adapted to:

- a) Osmotic challenges in aquatic environments (10 marks)
- b) Terrestrial respiration (10 marks)

QUESTION THREE (20 MARKS)

Discuss the evolution of the following systems in the animal kingdom

- a) Circulatory (10 marks)
- b) Nervous (10 marks)

QUESTION FOUR (20 MARKS)

Describe the following

- a) Reproductive adaptations in invertebrates (10 marks)
- b) Digestive adaptations in vertebrates (10 marks)

QUESTION FIVE (20 MARKS)

Describe thermal adaptations in animals