MACHAKOS UNIVERSITY

University Examinations 2019/2020 academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

SECOND YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE IN BIOLOGY

BACHELOR OF EDUCATION (SCIENCE)

SZL 202: COMPARATIVE PHYSIOLOGY

DATE: 20/1/2021 **TIME: 2.00-4.00 PM**

INSTRUCTIONS

1. Answer Question one (compulsory) and **any two** questions in Section B.
2. Use clean well labelled diagrams wherever appropriate.

SECTION A

QUESTION ONE (30 MARKS)

a) Differentiate between

   i. Book lungs and ventilation lungs (2 marks)

   ii. Iso-osmotic organisms and osmo-conformers (2 marks)

b) Explain

   i. how mosquitoes are adapted for acquisition of their food (2 marks)

   ii. Two (2) mechanisms of protection of the linings of digestive tracts (2 marks)

c) Describe three mechanisms by which Mammalian digestion is regulated (3 marks)

d) Outline three (3)

   i. osmoregulatory adaptations in terrestrial amphibians (3 marks)

   ii. challenges faced by terrestrial animals that have cutaneous respiration (3 marks)

e) Describe the mollusc circulatory system (4 marks)

f) Describe a functional classification of neurons (3 marks)

g) Outline three (3) reproductive differences between birds and mammals (3 marks)

h) Describe three (3) adaptations of endotherms to cold temperatures (3 marks)

SECTION B

QUESTION TWO (20 MARKS)

Explain how the mammalian digestive system is adapted to its function

QUESTION THREE (20 MARKS)

a) By use of a well labelled diagram, illustrate the structure of the elasmobranch circulatory system (8 marks)

b) Giving examples, describe the evolution of circulatory systems in animals (12 marks)

QUESTION THREE (20 MARKS)

Describe the structure and function of the human nervous system

QUESTION FOUR (20 MARKS)

Explain

a) Osmotic challenges encountered by animals in their diverse environments (9 marks)

b) Mechanisms by which terrestrial organisms are able to maintain osmotic balance in their environments (11 marks)