



# MACHAKOS UNIVERSITY

University Examinations 2019/2020 academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FIRST YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE IN BIOLOGY

BACHELOR OF EDUCATION (SCIENCE)

BACHELOR OF SCIENCE (AGRICULTURAL EDUCATION AND EXTENSION)

SZL 105/6:LABORATORY METHODS AND TECHNIQUES IN ZOOLOGY

DATE: 22/1/2021

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 (COMPULSORY) (30 MARKS)

- a) Describe three devices available for cutting sections in the laboratory (3 marks)
- b) Describe the the fluid mosaic model of the plasma membrane (3 marks)
- c) Explain the following terminologies as used in the laboratory (3 marks)
  - i. plasmodesma
  - ii. connexon
  - iii. Occludin
- d) Outline the process of setting good laboratory design principles (3 marks)
- e) Describe how tissue processing takes place in the laboratory (3 marks)
- f) Describe three intercellular junctions found in animal cells (3 marks)
- g) Explain the difference between embedding and sectioning (3 marks)

- h) Describe three main factors affecting sample stability (3 marks)
- i) Explain why it is important to keep most samples as cool as possible and in the dark (3 marks)
- j) Describe the following terminologies in relation to laboratory water handling (3 marks)
  - i. Amphiphilic
  - ii. Hydrophilic
  - iii. Hydrophobic

**SECTION B: CHOOSE AND ANSWER ANY TWO QUESTIONS.**

**QUESTION TWO (20 MARKS)**

Explain the common laboratory stains, providing their use, cytoplasms and what they specifically stain

**QUESTION THREE (20 MARKS)**

- a) Discuss six laboratory safety rules and regulations (12 marks)
- b) Describe the recipes for formulating the following reagents (8 marks)
  - i. Sorting solution
  - ii. 10% Phosphate Buffered Formalin
  - iii. Zenker's fluid
  - iv. Bouin's fluid

**QUESTION FOUR (20 MARKS)**

Explain the functions and components of the plasma membrane

**QUESTION FIVE (20 MARKS)**

Explain the requirement for fixing and preserving the following invertebrates

- a) Annelida
- b) Arthropoda
- c) Bryozoa
- d) Echinodermata
- e) Protozoa