



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, cytoplasm 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