



# MACHAKOS UNIVERSITY

University Examinations 2018/2019

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

SECOND YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR  
BACHELOR OF SCIENCE (AGRICULTURAL EDUCATION AND EXTENSION)

BACHELOR OF EDUCATION (SCIENCE)

BACHELOR OF SCIENCE IN BIOLOGY

SZL 207:ESSENTIALS OF CELL BIOLOGY

DATE: 25/7/2019

TIME: 8.30-10.30 AM

---

**INSTRUCTIONS: answer question one and any other questions**

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

## SECTION A

### QUESTION ONE COMPULSORY (30 MARKS)

- a) Briefly describe the following terms:-
- |               |          |
|---------------|----------|
| (a). Receptor | (1 mark) |
| (b). Ligand   | (1 mark) |
| (c).Connexins | (1 mark) |
- b) Describe the following cellular junction and their functions:
- |                     |            |
|---------------------|------------|
| (a) gap junctions   | (1½ marks) |
| (b). Tight junction | (1½ marks) |
- c) Briefly discuss the following mechanisms of cellular communication:-
- |                   |          |
|-------------------|----------|
| i. Endocytosis    | (1 mark) |
| ii. exocytosis    | (1 mark) |
| iii. phagocytosis | (1 mark) |
- d) Briefly discuss the main stages of cellular communication (3 marks)
- e) Define hormones and explain the role in communication between cells (3 marks)
- f) Explain the term antigen presentation (3 marks)

- g) Explain the following pathways of cell death:
- i. Necrosis (1½ marks)
  - ii. Apoptosis (1½ marks)
  - viii. Differentiate between necrosis and apoptosis (3 marks)
- h) Explain why a cancer cell defies its own control mechanisms (3 marks)
- i) Distinguish between benign and malignant tumours (3 marks)

## **SECTION B**

### **QUESTION TWO**

Discuss the applications of tissue culture in sciences and industry (20 marks)

### **QUESTION THREE**

Discuss Major histocompatibility complex molecules (20 marks)

### **QUESTION FOUR**

Discuss the various causing agents of cancer disease (20 marks)

### **QUESTION FIVE**

Describe the various ways in which the cell membrane aids in recognition of signals from other cells (20 marks)