



# MACHAKOS UNIVERSITY

University Examinations for 2021/2022 Academic Year

SCHOOL OF HEALTH SCIENCES

DEPARTMENT OF PUBLIC AND COMMUNITY HEALTH

FIRST YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (FOODS NUTRITION AND DIETETICS)

HFN 145: GENERAL BIOLOGY

DATE: 3/6/2022

TIME: 8.30-10.30 AM

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## INSTRUCTIONS:

This paper consists of two sections A and B

### SECTION A

#### Specific Instructions

- This section has one question
- The question is compulsory
- The question is 30 marks

### QUESTION ONE (30 MARKS)

- a) Define the following terms (3 marks)
- Histology
  - Mitochondria
  - Cytology
- b) Explain the cell theory (3 marks)
- c) Distinguish between prokaryotic and eukaryotic cells (3 marks)
- d) State the main functions of the following organelles (3 marks)
- Ribosomes
  - Peroxisomes
  - Microtubules
- e) Outline the levels of organization of living things (3 marks)

- f) Distinguish between the following; (6 marks)
- i. Animal cell and a plant cell
  - ii. Cell division in somatic and reproductive cell
  - iii. Gametogenesis in males and females
- g) State the types and functions of muscle tissue (6 marks)
- h) Outline the various patterns of inheritance and their application in the contemporary society (3 marks)

## **SECTION B:**

### **Specific Instructions**

- This section has four (4) questions
- Answer any two (2) questions
- Each question is 20 marks

### **QUESTION TWO (20 MARKS)**

Describe the cell cycle in reproductive cells

### **QUESTION THREE (20 MARKS)**

- a) With the aid of a well labelled diagram, explain the structure of the plasma membrane and the functions of each of its components. (10 marks)
- b) Describe types of epithelial tissues and their location in the human body. (10 marks)

### **QUESTION FOUR (20 MARKS)**

- a) Compartmentalization in cells is vital in chemical reactions for life processes. Explain the exchange of substances between various compartments in an organism. (10 marks)
- b) Describe different types of connective tissue and their composition (10 marks)

### **QUESTION FIVE (20 MARKS)**

- a) Describe the various membranes found in mammals and their functions. (10 marks)
- b) A female with albinism mates with a heterozygous male with normal phenotype skin color. Using Punnett squares determine the proportion of the F1 progeny that will have albinism. (10 marks)