MACHAKOS UNIVERSITY

University Examinations for 2022/2023 Academic Year

SCHOOL OF AGRICULTURE, ENVIRONMENT AND HEALTH SCIENCES

DEPARTMENT OF HEALTH SCIENCES

FIRST YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (FOODS, NUTRITION AND DIETETICS)

HFN 145: GENERAL BIOLOGY

DATE: **TIME:**

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) Outline the level of organization of living things   (4 marks)

b) Explain the structure of a bacteriophage   (4 marks)

c) Define the following terms   (2 marks)

       i) Histology

       ii) Cytology

d) Outline the characteristics that distinguishes crustaceans from arthropods (3 marks)

e) Explain the cell theory   (3 marks)

f) State the main functions of the following organelles (3 marks)

     i)   Golgi apparatus

     ii) Lysosomes

     iii) Cell wall

g) 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

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)

a) While describing the series of events that take place during interphase of cell cycle, explain why nerve cells are classified as permanent cells (10 marks)

b) Describe types of cells and tissues that make up the lungs of mammals. (10 marks)

QUESTION THREE (20 MARKS)

a) Draw a well labelled diagram of a plant cell as seen under a microscope. (10 marks)

b) Explain the type of changes in chromosomal structure that may occur following errors in meiosis (10 marks)

QUESTION FOUR (20 MARKS)

a) Discuss the effects of tonicity of fluids on an animal cell (10 marks)

b) Describe muscle tissues (10 marks)

QUESTION FIVE (20 MARKS)

a)   Describe the various membranes found in mammals and their functions.

(10 marks)

b)   A female with sickle cell disease mates with a normal phenotype heterozygous male.
        Using a pedigree show the proportion of the F1 progeny that will have sickle cell disease.

(10 marks)