



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)