



(University of Choice)

**MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)**

MAIN CAMPUS

**UNIVERSITY EXAMINATIONS
2023/2024 ACADEMIC YEAR**

MAIN EXAMINATION

FOURTH YEAR FIRST SEMESTER EXAMINATIONS

**FOR THE DEGREE
OF**

BACHELOR OF ENVIRONMENTAL HEALTH

COURSE CODE: HEH 415

COURSE TITLE: BIOTECHNOLOGY AND HEALTH

DATE: 7-12-2023

TIME: 2.00-4.00 PM

INSTRUCTIONS TO CANDIDATES

This paper is divided into two sections, **A** and **B**, carrying respectively: Short Answer Questions (**SAQs**) and Long Answer Questions (**LAQs**). Section A is compulsory. Section B answer any TWO questions.

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 2 Printed Pages. Please Turn Over.

SECTION A: SHORT ANSWER QUESTIONS
(40 MKS)

1. Illustrate each step of the central dogma. (8 Marks)
2. Describe the process of Polymerase Chain Reaction (PCR), including its steps and the materials required. (8 Marks)
3. Discuss the principles and types of Enzyme-Linked Immunosorbent Assay (ELISA) and provide examples of its applications in biotechnology. (8 Marks)
4. Outline the key steps involved in the hybridoma technology process. (8 marks)
5. Discuss the applications of artificial intelligence in the field of medical biotechnology. (8 marks)

SECTION C: LONG ANSWER QUESTIONS

(30 MKS)

ANSWER ANY TWO QUESTIONS

1. Explain the fundamental components and nomenclature of nucleic acids, with a focus on DNA. (15 Marks)
2. Recombinant DNA (r-DNA) technology plays a pivotal role in genetic engineering and biotechnology. Elucidate the key steps and methods involved in constructing recombinant DNA. (15 Marks)
3. Describe hybridoma technology and its applications [15 Marks].