



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF HEALTH SCIENCES**

**UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN
PUBLIC HEALTH AND COMMUNITY HEALTH AND DEVELOPMENT**

4th YEAR 1ST SEMESTER 2022/2023 ACADEMIC YEAR

MAIN CAMPUS

COURSE CODE: HCB 1407

COURSE TITLE: BIOTECHNOLOGY AND HEALTH

EXAM VENUE: STREAM: (BSc. Env. Hlth)

DATE: EXAM SESSION: DEC 2022

TIME: 2.00 HOURS

Instructions:

- 1. Answer ALL questions in Section A and ANY other TWO questions in Section B**
- 2. Candidates are advised not to write on Question Paper.**
- 3. Candidates must hand in the Answer Booklet to the Invigilator while in the Examination Room**

SECTION A: ANSWER ALL THE QUESTIONS (30 MARKS)

1. Define following terms (4 marks)
 - a. Human karyotypes
 - b. Genetically modified organisms
2. State **THREE** practical application of genetic testing (3 marks)
3. What is the difference between a gene and allele? (2 marks)
4. What are some of the major sources of genetic variations? (2 marks)
5. Give some of the importance of biotechnology to health (3 marks)
6. Outline the importance of DNA cloning in molecular biology (3 marks)
7. Give **THREE** examples of nuclease enzymes in genetic analysis and their uses (3 marks)
8. If your DNA sequence is 3' TAGCATGAT 5', what would be the mRNA sequence? (2 mark)
9. Briefly describe genetic epidemiology (4 marks)
10. A woman who is heterozygous for hemophilia alleles has children with a man who is hemophiliac. What is the chance of their sons and daughters having hemophilia? (4 marks)

SECTION B: ANSWER QUESTION ONE (1) AND ANY OTHER QUESTION (40 MARKS)

1. a) What are the steps involved in recombinant DNA technology? (10 marks)
b) Briefly describe the process of amino acids synthesis? (10 marks)
2. a) Discuss the structural abnormalities likely to occur in the chromosomes? (10 marks)
b) Describe the methods used in environmental biotechnology? (10 marks)
3. a) Describe any three named autosomal recessive genetic disorders (10 marks)
b) Describe five (5) characteristics of genetic code? (10 marks)
4. a) Discuss five (5) uses of genetic fingerprinting in science? (10 marks)
b) Illustrate some of the importance of genetic engineering in agriculture (10marks)