



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY  
SCHOOL OF HEALTH SCIENCES  
UNIVERSITY EXAMINATIONS  
FOURTH YEAR SECOND SEMESTER END OF SEMESTER EXAMS FOR DEGREE  
OF BACHELOR OF SCIENCE IN PUBLIC HEALTH  
SPECIAL EXAMINATIONS NOV. 2020**

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**COURSE CODE: HPD 3414**

**COURSE TITLE: Biotechnology and Health**

**EXAM VENUE:**

**STREAM:**

**DATE:**

**EXAM SESSION:**

**TIME: 2 HOURS**

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**Instructions:**

- 1. Answer all the questions in Section 'A' and ANY other two questions in Section 'B' each contain 20 marks**
- 2. Candidates are advised not to write on the question paper.**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room.**

**SECTION A: ANSWER ALL THE QUESTIONS IN THIS SESSION (30 MARKS)**

1. Differentiate between the following terms (4 marks)
  - a. Nucleotide and Nucleoside
  - b. Genome and genes
2. If your DNA sequence is 3' A C T G C A T G T 5', what would be the mRNA sequence? (2 mark)
3. What is a codon? (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. Name **THREE** examples and uses of nucleases enzymes in genetic analysis (3 marks)
8. Name some of the symptoms of Cri-du-Chat syndrome? (3 marks)
9. If in case some form hair has been found on a crime scene, what process can be used to identify the owner (of the hair) in a criminal investigation? (4 marks)
10. A woman who is homozygous for abnormal hemophilia alleles ( $X^H X^H$ ) has children with a man who is hemizygous for the normal form ( $X^H Y$ ). What is the chance of their sons and daughters having hemophilia? (4 marks)

**SECTION B: ANSWER ONLY TWO QUESTIONS IN THIS SESSION (40 MARKS)**

1.
  - a) Describe the steps involved in recombinant DNA technology? (10 marks)
  - b) Discuss briefly the process of protein 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) What is the human genome project (2 marks)
  - b) Discuss how knowing human genome is important in biotechnology? (8 marks)
  - c) What are the important features of a double helix model of a DNA? (10 marks)
4.
  - a) Discuss importance of fingerprinting in science? (10 marks)
  - b) Illustrate some of the importance of genetic engineering in agriculture (10 marks)