



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND  
TECHNOLOGY**

**UNIVERSITY EXAMINATIONS**

**2019/2020**

**THIRD YEAR, RESIT EXAMINATION FOR THE DEGREE OF BACHELOR OF  
SCIENCE (BIOLOGICAL SCIENCES)**

**COURSE CODE: SB1 3314**

**COURSE TITLE: Molecular Biology**

**DATE**

**TIME**

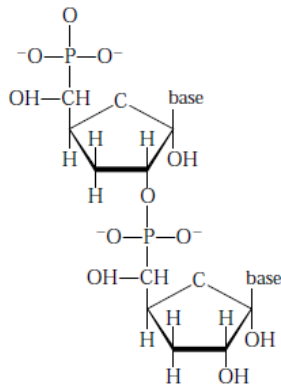
**DURATION: 2 HOURS**

**INSTRUCTIONS:**

- 1. This paper contains two sections (A and B)**
- 2. Answer ALL questions in Section A and any Two (2) questions in Section B**
- 3. Write ALL answers in the booklet provided**
- 4. You may use illustrations in your answers as you deem necessary**

**SECTION****30 MARKS**

1. List three general characteristics of genetic material (3 marks).
2. Describe the Hershey and Chase experiment highlighting the logic behind its conclusion that DNA and not protein is genetic material (3 marks)
3. Explain the contribution of the Meselson and Stahl experiment to present-day understanding of DNA replication mechanisms (3 marks)
4. Assume that the illustration below is of a DNA strand. Highlight any six mistakes you can see (3 marks)



5. List the modifications that eukaryotic mRNA undergoes during its processing (3 marks).
6. List the different types of RNAs and state their functions (3 marks)
7. Describe the concerns of the below-listed domains of genomics
  - a. structural genomics (1 marks)
  - b. functional genomics (1 mark)
  - c. comparative genomics (1 mark)
8. Explain the role of restriction endonucleases in gene cloning (3 marks).
9. Outline three attributes of plasmids that potential vectors for carrying cloned DNA (3 marks)
10. Describe the advantages that cosmids have over plasmids as vectors of choice in gene cloning (3 marks).

**SECTION B (ANSWER ANY TWO QUESTION)****40 MARKS**

11. Write an essay on DNA replication (20 marks)
12. Give a detailed account of the process of translation (20 marks)
13. Discuss the sequencing strategy that was used in the Human Genome Project (20 marks).
14. Discuss the mechanisms of DNA repair. (20 marks)