UNIVERSITY EXAMINATION

CHUKA  **UNIVERSITY**

RESIT/SPECIAL EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE

BOTA 413: MOLECULAR AND MICROBIAL GENETICS

STREAMS: **TIME: 2 HOURS**

DAY/DATE: WEDNESDAY 05/05/2021 **2.30 P.M – 4.30 P.M**

INSTRUCTIONS:

Answer all questions in section A and any two in section B
SECTION A

1. Describe the structure of a nucleotide (5 marks)

2. Describe the central dogma of molecular biology (5 marks)

3. Describe how proteins are synthesized in prokaryotic cells (6 marks)

4. With explanation, State whether the following statements are true of false
   i. Changes in the DNA sequence always bring about changes in the protein sequence. (2 marks)

   ii. Most codons used in prokaryotes have different meaning in eukaryotes (2 marks)

5. During transcription a single nucleotide was lost from a gene. This changed the amino acid sequence of the protein.
    i. Explain What could have caused this change in the DNA sequence (2 marks)
    ii. What specific name is given to such a change (2 marks)

6. List the types of modifications that occur to proteins after translation (6 marks)

SECTION B

7. Describe how microorganisms acquire new traits (20 marks)

8. Describe the features of a plasmid used in transformation (20 marks)

9. Explain how you can produce human insulin in E. coli bacteria (20 marks)
