

**FEDRAL UNIVERSITY OF TECHNOLOGY, MINNA**  
**DEPARTMENT OF PLANT BIOLOGY**  
**FIRST SEMESTER BTECH EXAMINATION, 2017/2018 SESSION**

**COURSE CODE: BIO 313**

**COURSE TITLE: MOLECULAR BIOLOGY**

**CREDIT UNITS: 2 UNITS**

**TIME ALLOWED: 1 HOUR 30 MINUTES**

**INSTRUCTION: ANSWER THREE (3) QUESTIONS IN ALL; ONE QUESTION FROM EACH SECTION**

**SECTION A**

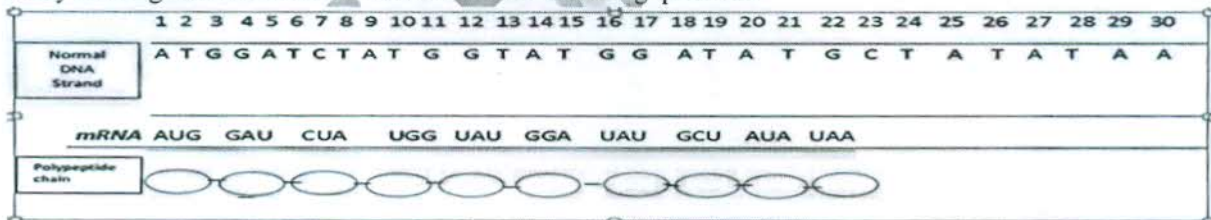
1. a. Give a concise definition of each of the following:
  - i. Protein Evolution
  - ii. Gene Conversion
  - iii. Molecular phylogenetics
  - iv. Recombination
  - v. Retrotransposition
- b. Distinguish between the following terms
  - i. Recon and Muton
  - ii. Transition and Transversion
  - iii. Codon and Anticodon
  - iv. Transcription and Translation
  - v. Structural genes and Regulatory genes

**SECTION B**

2. a. With the aid of diagram **only**, describe the structure of the following DNA bases:
  - i. Thymine
  - ii. Adenine
  - iii. Cytosine
  - iv. Guanine
- b. Explain with clarity, the term Molecular Evolution
- c. Complete the sequence pairing in the following nitrogenous bases: A, T, U, G, C, U, T, A, G, C
3. a. Explain clearly the roles of nucleotide bases in gene expression
- b. Write notes on the contents of the molecular bases of gene
- c. Mention three scientists that contributed towards the development of molecular biology.

**SECTION C**

4. Study the diagram below and use it to answer the following questions.



- a. Fill in the empty circles with appropriate polypeptide chain.
  - b. How many amino acids are produced?
  - c. How many base pairs are there in the DNA strand?
  - d. How many messenger RNA are produced?
  - e. If a G-C nucleotide is added between base pair 4 and 5 and between base pair 21 and 22,
    - i. What will be the new sets of the messenger RNA codons
    - ii. What will their corresponding amino acids?
    - iii. What type of gene mutation is shown in 4(e)?
  - f. Highlight the Semi-conservative model of the Gene replication
5. a. Explain in detail the discontinuous replication of DNA
  - b. Mention any five (5) nature of genetic code
  - c. Why is Genetic Engineering much easier nowadays?
  - d. Describe the Central Dogma of Molecular Biology.