



GWANDA STATE UNIVERSITY
FACULTY OF LIFE SCIENCES
DEPARTMENT OF CROP SCIENCE
BACHELOR OF SCIENCE HONOURS DEGREE IN CROP SCIENCE
LAS 1107 MOLECULAR BIOLOGY
FIRST SEMESTER EXAMINATION
JANUARY 2021

This examination paper consists of 3 pages

Time Allowed: 3 hours
Total Marks: 100
Special Requirements: None
Examiner's Name: Dr. T Goche

INSTRUCTIONS

1. Answer **all** questions in Section A
2. Answer **only two** questions in Section B

MARK ALLOCATION

QUESTION	MARKS
SECTION A	60
SECTION B	40
TOTAL ATTAINABLE MARKS	100

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SECTION A: ANSWER ALL QUESTIONS IN THIS SECTION

1. a) Explain the Central dogma and reverse Central dogma of molecular biology. (5)
b) Discuss the structure of
 - i. DNA (5)
 - ii. RNA (5)
 - iii. a gene (5)

2. a) Giving examples where necessary, explain the following terms/concepts:
 - i. genetic code (3)
 - ii. mutation (3)
 - iii. RNA splicing (3)
 - iv. start codon (3)
 - v. operon (3)b) What is meant by repression and induction of *lac* operon? (5)

3. a) Outline the events involved in DNA replication. (8)
b) Mention the functions of at least three different types of RNA. (6)
c) What are the functions of ligases and helicases? (6)

SECTION B: ANSWER ANY TWO QUESTIONS IN THIS SECTION

4. Explain the initiation, elongation and termination processes of translation in prokaryotes. (20)

5. Give an account on the mechanism of protein synthesis. (20)

6. a) Define transcription. (2)
- b) Name the enzyme that catalyses the transcription process and state additional requirements for its function. (6)
- c) Give another name for 'antisense strand' (2)
- d) Give another name for the 'Hogness box' (2)
- e) Explain the function of transcription factors. (4)
- f) State the function of reverse transcriptase. (2)
- g) Name one codon that terminates protein synthesis. (2)
7. With suitable illustrations, describe *trp* operon model. (20)

END OF EXAMINATION PAPER