



NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF APPLIED SCIENCE
DEPARTMENT OF APPLIED BIOLOGY AND BIOCHEMISTRY
BACHELOR OF SCIENCE HONOURS DEGREE IN APPLIED BIOLOGY AND
BIOCHEMISTRY
CHEMISTRY OF BIOMOLECULES (SBB1208)

Main Examination Paper

MARCH 2025

This examination paper consists of 3 pages

Time Allowed : 3 hours
Total Marks : 100
Special Requirements : NONE
Examiner's Name : PROF. N. BASOPO

INSTRUCTIONS

1. Answer **Four (4)** questions. Each question carries 25 marks.
2. Where a question contains subdivisions, the mark value for each subdivision is given in brackets.
3. Illustrate your answer where appropriate with large, clearly labelled diagrams.

MARK ALLOCATION

QUESTION	MARKS
1.	25
2.	25
3.	25
4.	25
5.	25
6.	25
TOTAL	100

1.(a) Draw the following fatty acid and circle the γ , β , and δ carbon atoms on the structure: (3 marks)



(b) Describe the molecular structure of water and explain how it contributes to its unique properties. (10 marks)

(c) Analyze the similarities and distinctions in the chemical structures and physiological functions of progesterone and estradiol. (12 marks)

2.(a) Differentiate between homopolysaccharide and heteropolysaccharide. (2 marks)

(b) Draw the oligopeptide pro-glu-pro-thr-Ile-asp-glu and write the amino acid names in full as well as their one letter symbols. (7 marks)

(c) Discuss the levels of organisation of protein structure giving reference to collagen. (16 marks)

3.(a) Write short notes on the following forms of RNA:

(i) mRNA. (4 marks)

(ii) tRNA. (4 marks)

(iii) rRNA. (4 marks)

(b) Explain how amino acids are grouped according to the characteristics of their side chains. (13 marks)

4.(a) Draw the structure of a purine ring and identify the sources of all the atoms that make up the ring. (8 marks)

(b) Give an account of the biological functions of carbohydrates. (17 marks)

5.(a) Describe the bonds responsible for maintaining a protein's three-dimensional structure. (7 marks)

(b) Give a detailed description of the sugars, maltose, sucrose and lactose. (18 marks)

6.(a) Write brief notes on the following types of lipids:

(i) Glycolipids.

(5 marks)

(ii) Triglycerides.

(5 marks)

(iii) Phospholipids

(5 marks)

(b) Define denaturation and describe its causes and effects on proteins.

(10 marks)

END OF EXAMINATION