



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 (SBB 1208)

Main Examination Paper

SEPTEMBER 2024

This examination paper consists of 2 pages

Time Allowed : 3 hours

Total Marks : 100

Special Requirements : NONE

Examiner's Name :

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 tripeptide Ser-Tyr-Gln. (3 marks)
- (b) Calculate the hydrogen ion concentration of a solution if the hydroxyl ion concentration is 5.0×10^{-8} M and indicate whether the solution is acidic basic in nature. (5 marks)
- (c) Describe the different levels of protein structure using haemoglobin as an example. (17 marks)
- 2.(a) Write short notes on the following:
- (i) Maltose. (5 marks)
- (ii) Sucrose. (5 marks)
- (iii) Lactose. (5 marks)
- (b) Differentiates between B-DNA and Z-DNA. (10 marks)
- 3.(a) Briefly describe the following properties of water:
- (i) Cohesion. (3 marks)
- (ii) Capillary action. (3 marks)
- (iii) Adhesion. (3 marks)
- (iv) Specific heat capacity. (3 marks)
- (b) Distinguish between glycolipids and phospholipids. (13 marks)
- 4.(a) Compare and contrast DNA and RNA. (10 marks)
- (b) Classify amino acids based on the chemical properties of their side chains. (15 marks)
- 5.(a) Write short notes on starch and glycogen. (10 marks)
- (b) Discuss the classification of proteins according to their functions. (15 marks)
- 6.(a) Draw the fatty acid C₂₂:₄ (cis, cis, trans, trans $\Delta^{6,10,15,19}$) and circle the beta, gamma and omega carbon atoms on the structure. (6 marks)
- (b) Give an account of the bonds that maintain the three dimensional structure of a protein. (7 marks)
- (c) Compare and contrast the structures and functions of progesterone and estrone. (12 marks)

END OF EXAMINATION