



University of Ruhuna- Faculty of Technology
Bachelor of Biosystems Technology Honors Degree
Level 1(Semester I) Examination, November/December 2025
Academic year 2024/2025

Course Unit: BST 1152 – Basic Biochemistry (Written)

Duration: 1.5 hours

- Answer **Three (03)** questions out of Four (04) questions.
- Use a separate book for answering the questions
- Each question should be started with a new page

Question One

Carbohydrates serve important structural and energy roles.

- a) What is hexose sugar? Name two biologically important hexoses. (10 marks)
- b) Define “monosaccharides” and state two (02) common criteria used to classify monosaccharides. (20 marks)
- c) Illustrate the formation of lactose, clearly labeling the constituent monosaccharides and the glycosidic bond. (30 marks)
- d) Briefly describe structural polysaccharides. Give two (02) examples and explain how their structures are related to their functions. (40 marks)

Question Two

“Proteins play an essential role in the structure and function of living organisms.”

Answer all parts of the question.

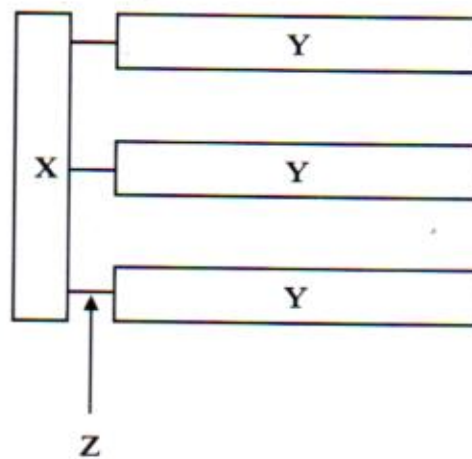
- a) Illustrate (draw) the formation of a peptide bond between two amino acids. Describe the process briefly.

(20 marks)

- b) Differentiate between essential and non-essential amino acids. Provide at least two examples from each category and explain their significance in human nutrition. (30 marks)
- c) State any four (04) general properties of proteins. (20 marks)
- d) Describe the four levels of protein structure (primary, secondary, tertiary, and quaternary). Include diagrams where necessary to support your answer. (30 marks)

Question Three

Lipids may seem simple, but they hold the key to cellular integrity and metabolic balance.



- a) Observe the above given illustration and answer these questions. (25 marks)
- Identify the biomolecule shown in the diagram.
 - Label the parts marked X, Y, and Z.
 - To which major class of biomolecules does this molecule belong?

- b) Write 4 major groups of lipids with one example for each. (25 marks)
- c) List two lipid-related disorders and briefly explain how those conditions occur. (30 marks)
- d) How lipids are important to soap production. (20 marks)

Question Four

- I. "Enzymes are essential biological catalysts that regulate biochemical reactions in living systems."
 - a) Explain what enzymes are and describe their major functions in biological systems. (20 marks)
 - b) Describe the two major mechanisms involved in enzyme–substrate complex formation. Include diagrams where appropriate. (30 marks)
- II. "Nucleic acids are essential biomolecules in the storage and expression of genetic information."
 - a) Differentiate between DNA and RNA in terms of structure, components, and functions. (25 marks)
 - b) Identify the three main types of RNA and describe the specific role each plays in protein synthesis. (25 marks)

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