24

RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

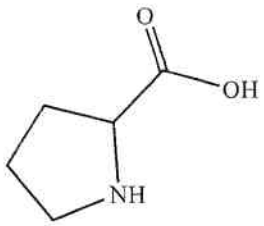
B.Sc. in Applied Sciences
Second Year – Semester II Examination – September / October 2020

CHE 2104 – INTRODUCTION TO BIOCHEMISTRY

Time: One (01) hour

Answer all questions.

1. Structure of the proline is given below.



a) Draw the zwitterionic form of proline. (6 marks)

b) Label the imine group in the same structure drawn in part a. (6 marks)

c) How many chiral centers does it have? (6 marks)

d) State the contribution of the proline to the conformation of proteins in terms of flexibility. (7 marks)

2. a) Give characteristic features of the α-helix structure in the secondary proteins. (8 marks)

b) How does the structure of β-sheet differ from that of α-helix. (5 marks)

c) In an enzymatic reaction, the reaction velocity increases with temperature to a certain extent. Explain the reason using a free energy diagram. (12 marks)

3. a) Polysaccharides can be primarily divided into two categories, homopolysaccharides and heteropolysaccharides. What is the difference between them? Give two examples for each. (9 marks)

b) Describe the term "epimers" using a suitable example. (8 marks)

c) What is the major chemical difference of cellulose and chitin in terms of bonding. Explain with the aid of suitable structures? (8 marks)

4. Sigmoidal shape of the oxygen binding curve indicates the cooperative binding of O_2 molecules to Hemoglobin.

a) Sketch the binding site of heme molecule when O_2 molecule is bound. (5 marks)

b) What do you mean by "cooperative binding"? (10 marks)

c) Briefly describe the Bohr effect. (10 marks)

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