# UNIVERSITY COLLEGE LONDON

# EXAMINATION FOR INTERNAL STUDENTS

MODULE CODE : **BIOC0006**

ASSESSMENT Pattern: **BIOC0006A5UF**

MODULE NAME : **BIOC0006 - Essential Protein Structure and Function**

LEVEL: : **Undergraduate**

DATE: : **03-May-2024**
TIME : **10:00**
DURATION : **2 Hours**

Late submission is permitted for Controlled Conditioned exams but late penalties will apply - any submissions that are up to 40 minutes late will be penalised, after which no submissions will be accepted under any circumstances.
You must ensure to allow sufficient time to upload and hand in your work

This paper is suitable for candidates who attended classes for this module in the following academic year(s):

**Year**
**2023/24**

| Duration | 2 Hours |
|---|---|
| **Additional time for converting handwritten notes to PDF where applicable** | **n/a** |
| **Upload window** | **20 Minutes** |
| **Total time** | **2 Hours 20 Minutes** |

| | |
|---|---|
| **Additional material** | N/A |
| **Special instructions** | N/A |

**TURN OVER**

**BIOC0006: Essential Protein Structure and Function**

**Construction of answers:**

You have a period of two hours to complete this exam. You have an additional 20 minutes to upload your answers to AssessmentUCL.

The word limit for each question is 600 words. Any words over this limit will not be marked. Please include a word count at the end of each answer.

Use of references and referencing: You may refer to lecture material, books, reviews, papers, etc. whilst writing your answers and you should include brief citations in the text indicating the source of any extra reading e.g. 'Protein 1 binds to protein 2 when it is phosphorylated (Jones et al. 2008)'. You do not need to include a list of references at the end of your answer. You must write your answers in your own words.

You are encouraged to use annotated diagrams to explain your answers when necessary. You can hand draw figures and insert an image file, or use a simple drawing application. DO NOT paste figures or images from other sources. Words included in a diagram itself, such as labels, will not count towards the word count. Figure legends are not required; if included, words in a legend will be counted towards the word count.

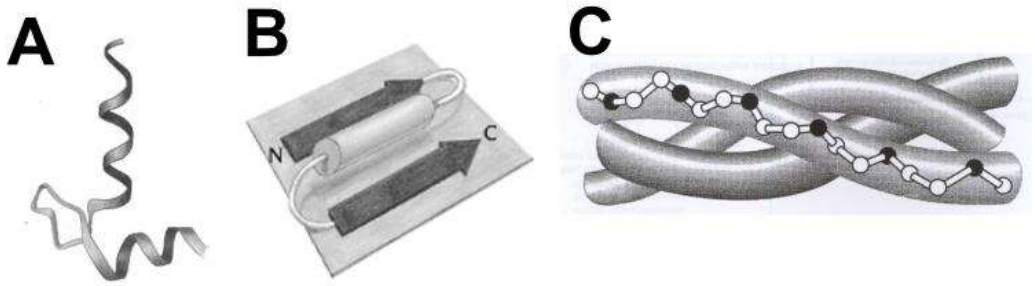
**Marking:**

Answers will be awarded percentage marks based on the 'UCL FLS Exam Essay Marking Guidelines'.

**TURN OVER**

**ANSWER THREE QUESTIONS FROM THE SELECTION BELOW.**
**You are encouraged to use diagrams to illustrate your answers.**

1. Identify the following protein structural motifs as illustrated, describe their main structural features, and give examples of proteins in which these motifs are present.




2. Describe the protein structure of myoglobin, explaining the role of its secondary structure and its major prosthetic group. Describe with the help of a graph how myoglobin binds to oxygen, and explain how this binding differs from that of oxygen to haemoglobin.

3. Draw a full one-page domain diagram of a typical IgG antibody molecule and label it clearly to show its main constituent parts that together enables IgG to perform its function. Explain how each of these parts contributes to its function.

4. Name three enzymes which are key to the function of the thyroid gland. Describe the reactions that they catalyse and how their activity can result in disease.

5. Describe the molecular mechanism by which Z alpha-1-antitrypsin forms polymers in alpha-1-antitrypsin deficiency. In your answer, also explain ONE strategy that you could use to prevent the formation of polymers in liver cells, and explain why you think that this could be an effective treatment.

**END OF PAPER**