Biochemistry of Proteins 2.463 **March 6, 2004**

Term Test-2

Answer all questions in the Exam Booklets. Put your name and student number on all exam booklets. You may use a calculator, structures and diagrams where appropriate.

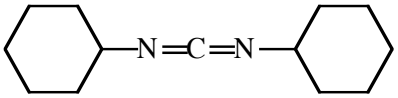
The total number of marks is 48, and you have 50 minutes to complete the exam, so spend about 1 minute per mark i.e. 15 min. for a 15-mark question etc.

Answer question 1.

(4) 1. Why is peptide synthesis on a solid-phase far more effective than solution phase-synthesis?

Answer only 1 of questions 2 and 3.

(10) 2. With the use of structures and a mechanism, explain how the following compound can be used to convert a chemically inert amino acid into a highly reactive molecule able to form a peptide bond.



OR

(10) 3. Explain what is circular dichroism spectropolarimetry and its use in the study of proteins. In your answer, use the following equation and be sure to explain the meanings of all the symbols.

$$[\square] = x\,[\square]_{\square} + y\,[\square]_{\square} + z\,[\square]_{t} + r\,[\square]_{i}$$

Answer all of the following questions.

(6) 4. Explain the origin of "Termination Peptides" and "Deletion Peptides" in solid-phase peptide synthesis.

(6) 5. Explain why it might be important to synthesize a peptide with a blocked N- and C-terminus.

(12) 6. Draw and label a Ramachandran diagram and indicate the positions of right and left-hand $\square$-helices. Explain why it is possible to describe the conformation of a polypeptide using two bond angles only.

(10) 7. Name, and briefly explain, the two recently-developed methods for producing ionized protein molecules in the gas phase, that have made mass spectrometry of proteins possible.