

**Term Test-1**

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

*The total number of marks is 45, 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. It is worth 6 marks.**

1. Draw the chemical structure at pH 7 of **one** of the peptides that results from the treatment of the following peptide with chymotrypsin:  
Ser-Glu-Pro-Trp-Leu-Ile-Gly

**Answer question 2 OR question 3. Each is worth 15 marks.**

2. Describe in chemical detail the main steps of an Edman degradation indicating the role and importance of pH, buffers, and organic solvents.
3. With the use of the following equation describe sedimentation equilibrium analysis of proteins. Be sure to describe how the method works, what is measured, and the advantages of sedimentation equilibrium over other methods of protein analysis that yield similar information:

$$\frac{dr}{dt} = \frac{M_r(1 - \bar{v}\rho)\omega^2 r}{N \cdot f}$$

**Answer questions 4 AND 5. Each is worth 6 marks.**

4. Describe briefly the use of **3** of the following 4 materials in the analysis of proteins:  
octadecyltrichlorosilane  
polyacrylamide  
Constant boiling 6N HCl.  
Ninhydrin
5. Explain how Immobilized Metal Affinity Chelate Chromatography can be used to purify proteins.

**Answer question 6. It is worth 12 marks.**

6. Explain the chemical reactivity of the amino acid Cys, give some examples, and describe the role of this chemistry in the folding of proteins.