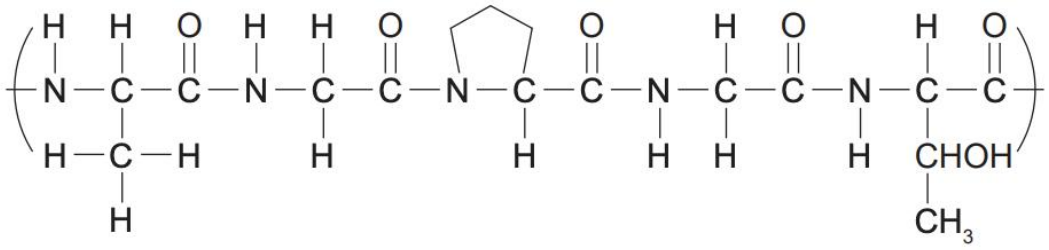
Question 41 **(12 marks)**

When insects touch a spider's web they become stuck and therefore, easy prey for the spider. The insects become stuck because the web is coated with a glue-like substance produced by the spider. The 'spider glue' consists of water, proteins, ionic salts and polar carbon compounds.

The structural formula given below shows a small section of a spider glue protein.

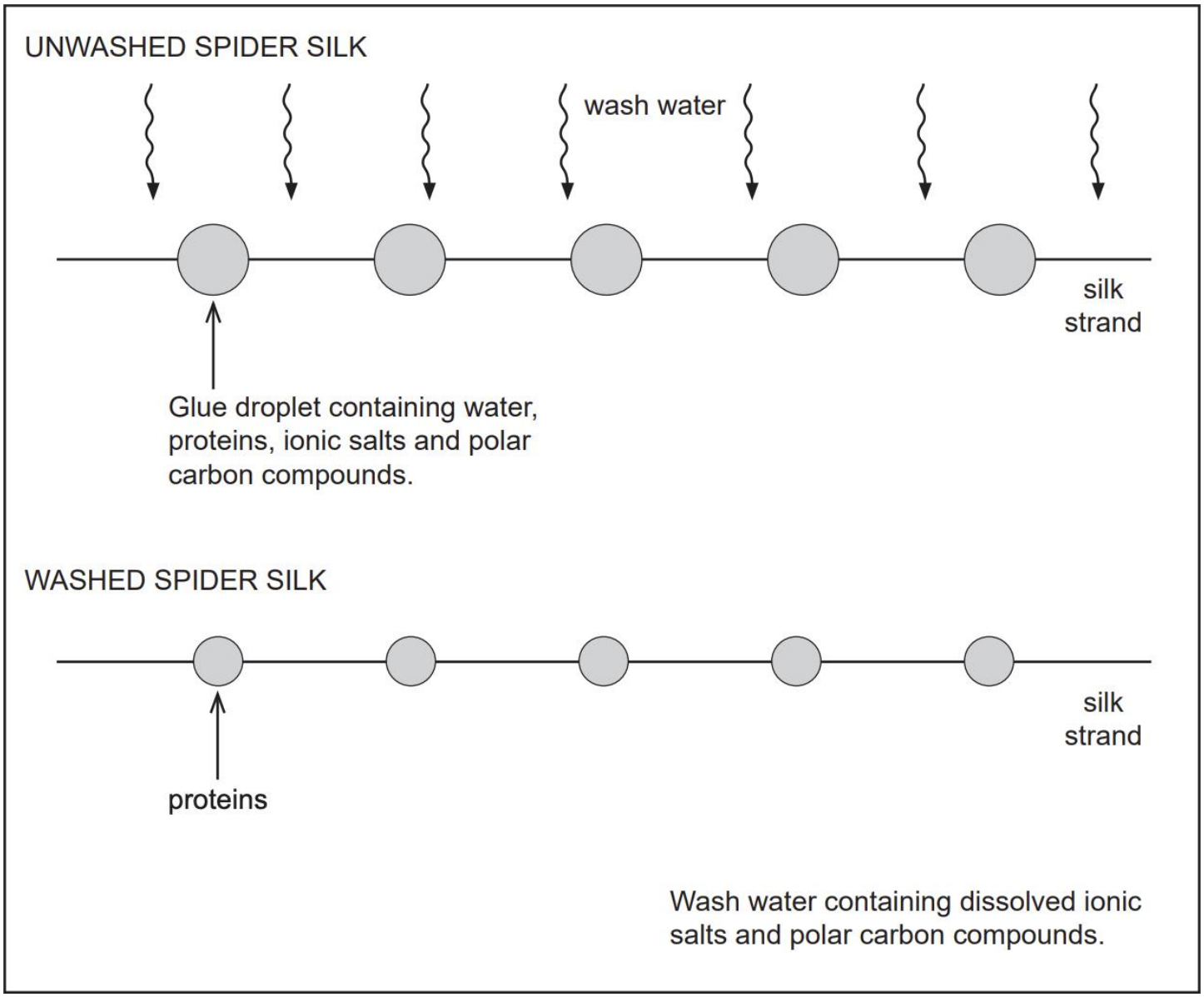


(a) List the names of the amino acids in the order in which they were drawn in the section of the protein given above. Do **not** use abbreviations. (3 marks)

(b) Circle **one** peptide bond in the above structure. (1 mark)

(c) What is the difference between the primary structure and the secondary structure of a protein? (2 marks)

When spider glue is washed with water, the ionic salts and polar carbon compounds dissolve. The proteins do not dissolve and remain on the silk strand. The following diagram shows what happens.



(d) Explain why the polar carbon compounds dissolve in water but the proteins do not. Illustrate your answer with the aid of a labelled diagram. (6 marks)