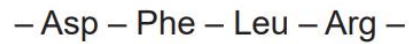


Question 34**(13 marks)**

Keratin 86 is a protein found in human fingernails. A small section of the amino acid sequence of Keratin 86 is shown below:



- (a) Draw the full structural formula of this small section of Keratin 86. (3 marks)



The amino acid chains in Keratin 86 form α -helices, with two α -helices twisting around each other to form what is called a 'coiled coil' that is held together by disulfide bridges.

- (b) Circle the protein structural level represented by an α -helix. (1 mark)

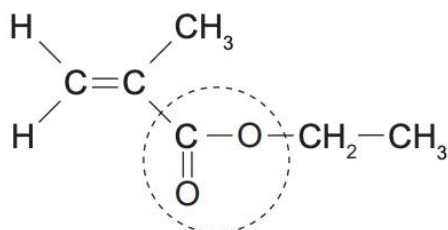
primary

secondary

tertiary

- (c) What does the presence of disulfide bridges indicate about the primary structure of Keratin 86? (1 mark)

Synthetic fingernails are a popular fashion accessory. They are made in industrial laboratories from polymers. A monomer that can be used to make a polymer suitable for synthetic fingernails is shown below.

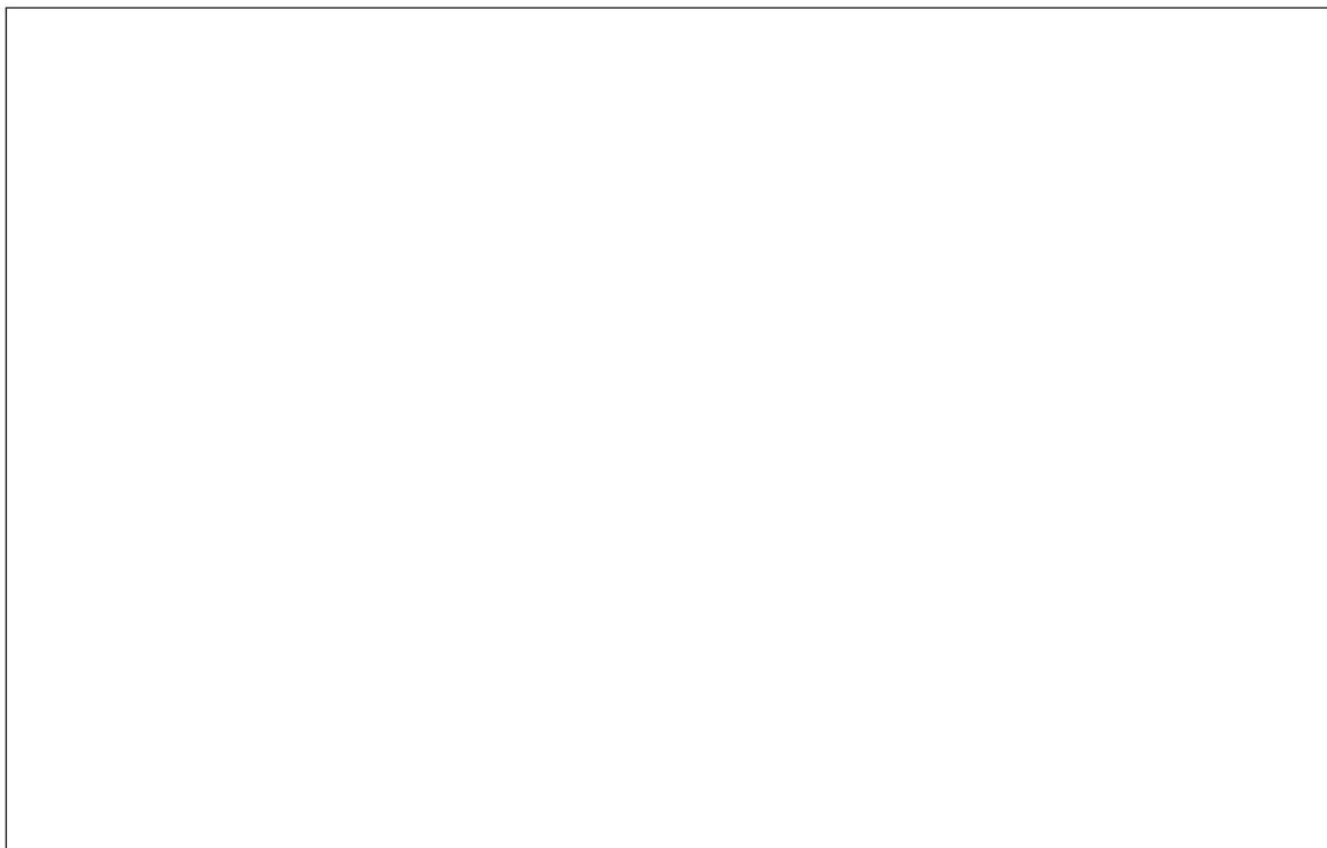


- (d) Name the circled functional group in this monomer. (1 mark)

- (e) Give the IUPAC name of the alcohol needed to make this monomer. (1 mark)

(f) Draw **three** repeating units of the polymer made from this monomer.

(2 marks)

A large, empty rectangular box with a thin black border, intended for the student to draw the repeating units of a polymer. The box is oriented horizontally and occupies the majority of the page below the question text.

The protein which makes natural fingernails, Keratin 86, is also a polymer.

- (g) What type of polymerisation reaction produces Keratin 86 and what type produces synthetic fingernails? (2 marks)

Polymer	Type of polymerisation reaction
Keratin 86	
Synthetic fingernail polymer	

- (h) State **two** differences between the polymerisation reaction types identified in part (g). (2 marks)

One: _____

Two: _____
