

#### 4.8 EXERCISE 1 – amino acids

1.
  - a) Draw the structure of 2-aminobutanoic acid
  - b) Draw the two optical isomers of 2-aminobutanoic acid
  - c) Write equations to show the reaction of 2-aminobutanoic acid with
    - i) hydrochloric acid
    - ii) sodium hydroxide
  - d) Draw the structure of the dipeptide formed by the condensation of
    - i) two molecules of 2-aminobutanoic acid
    - ii) three molecules of 2-aminobutanoic acid
    - iii) four molecules of 2-aminobutanoic acid
2.
  - a) Describe the shape of the protein molecule and explain why it has this shape.
  - b) Draw the organic products formed when the following protein is heated with concentrated hydrochloric acid:

