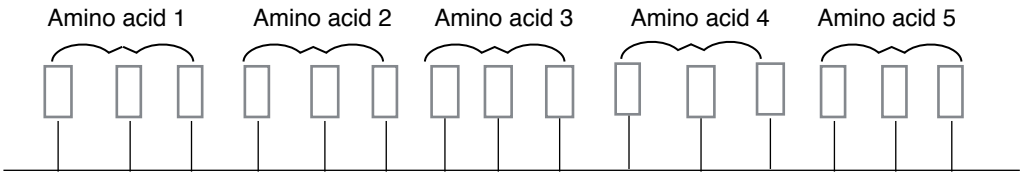
1 A molecule of DNA contains four different bases.

The four bases are arranged in a long chain. The chain of bases controls the synthesis of a protein.

For example, the chain of bases could make a protein that determine's eye colour. The diagram below shows some bases along a strand of DNA.



1 (a) (i) What word is used to describe 'a small section of a DNA molecule that controls the synthesis of a protein'?

Gene / allele [1 mark]

Remember an allele is a different form of a gene, so its acceptable as an answer here.

(1 mark)

1 (a) (ii) In the cell, where are proteins synthesised

in / on ribosome(s) [1 mark]

(1 mark)

1 (a) (iii) Describe how proteins are synthesised from the chain of bases in DNA. Use the diagram to help you answer this question.

amino acids make up a protein [1 mark]

(protein is) particular combination / sequence (of amino acids) [1 mark]

bases form a code [1 mark]

the bases work in threes or description [1 mark]

(code / three bases) for one amino acid [1 mark]

(3 marks)

1 (b) Mistakes sometimes occur when DNA molecules are copied during cell division.

Suppose that one of the **W** bases shown in the diagram was substituted by an **X** base.

What might be the effect of this change in structure of the protein?

Protein made incorrectly / would not function properly [1 mark]

In this case, you'd be given 'change eye colour' because it is mentioned in the question.

(1 mark)

(Total 6 marks)