



1 Explain how crossing over can contribute to genetic variation.

(3 marks)

AQA, 2004

2 **Figure 1** shows a short section of a DNA molecule.

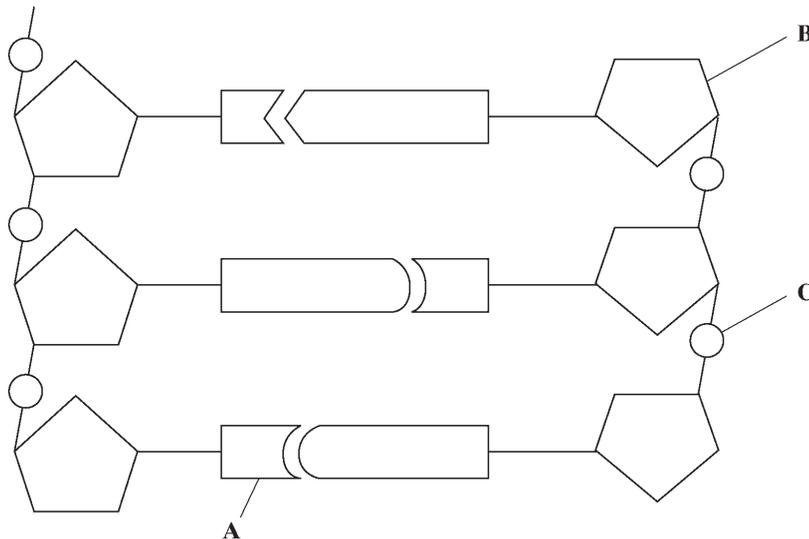


Figure 1

(a) Draw a diagram to show a single nucleotide using the information in **Figure 1**.

(1 mark)

(b) Use the letters in **Figure 1** to indicate a part of the molecule which:

- (i) is a base
- (ii) contains nitrogen.

(2 marks)

(c) (i) The sequence of bases on one strand of DNA is important for protein synthesis. What is its role?

(ii) How are the two strands of the DNA molecule held together?

(iii) Give **one** advantage of DNA molecules having two strands.

(3 marks)

AQA, 2005

3 (a) Explain what is meant by:

- (i) an allele
- (ii) a gene.

(2 marks)

(b) Lysozyme is an enzyme consisting of a single polypeptide chain of 129 amino acids.

What is the minimum number of nucleotide bases needed to code for this enzyme? (1 mark)

AQA, 2005

- 4 (a) **Figure 2** shows two pairs of chromosomes from a plant cell. The letters represent alleles.

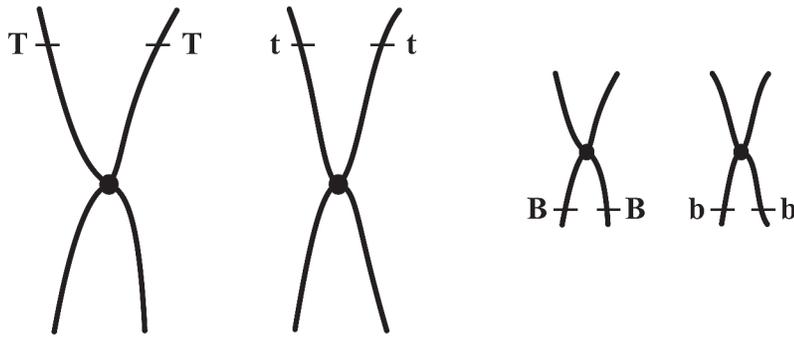
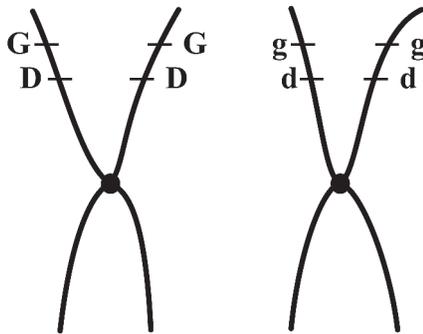


Figure 2

- (i) Give all the different types of the gametes which could be produced by this plant.
 (ii) One chromosome has two copies of allele **T**. What occurs during meiosis which results in only one copy of the allele **T** being present in a gamete? (2 marks)
- (b) **Figure 3** shows another pair of chromosomes from the same plant cell. The table shows the numbers of gametes with each type produced by this plant.



Genotype of gametes	GD	gd	Gd	gD
Number of gametes	1096	1124	210	230

Figure 3

- (i) Describe what happens during meiosis, which results in the new combinations of alleles, **Gd** and **gD**.
 (ii) Suggest why there are fewer gametes with types **Gd** and **gD** than **GD** and **gd**. (4 marks)
- 5 Copy and complete the table to show **three** differences between the structure of the DNA in a palisade cell in a leaf and a bacterium. (3 marks)

A palisade cell in a leaf	A bacterium