

AQA, OCR, Edexcel

A Level

A Level Biology

**Nucleic Acids and DNA
Replication Questions**

Name:

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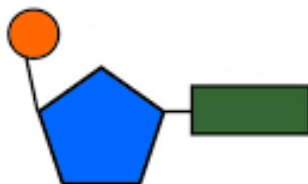
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Total Marks: /31

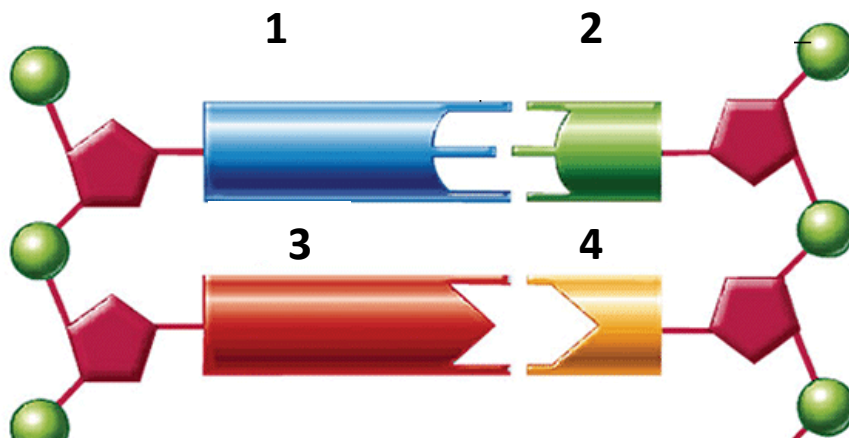
Nucleic Acids & Replication

1. Deoxyribonucleic acid is the genetic material that contains all the instructions an organism needs to survive, develop and reproduce.

a) The diagram below shows a DNA molecule.



- i) Label the nucleotide shown above (3 marks)
 - ii) What is the name of the bond that joins two nucleotides together to form the sugar phosphate backbone? (1 mark)
- b) The two polypeptide chains that make up DNA are wound around each other to form a helix.
- i) Explain why the helical structure is advantageous to the hereditary nature of DNA? (4 marks)
 - ii) Label the nitrogenous bases on the diagram below. (4 marks)



iii) Why is complementary base pairing advantageous? (1 mark)

iv) What is the function of histones? (1 mark)

2. The genetic code is defined by its unique characteristics that not only allow it to be passed on from generation to generation, but also mean that the code can be read as instructions within each cell.

i) What is a codon? (1 mark)

ii) What is meant by the term non-overlapping in relation to the genetic code? (1 mark)

iii) What is meant by the term universal in relation to the genetic code? (2 mark)

b) The genetic code is copied from DNA into mRNA.

i) Explain why mRNA is produced instead of DNA being the direct code for translation? (2 mark)

ii) How does tRNA add amino acids to the growing polypeptide chain? (3 mark)

c) A single DNA strand has the genetic code shown below. What would the mRNA and tRNA corresponding codons and anti-codons be? (3 marks)

DNA: A T C C T G T A T G

3. For organisms to grow and repair, cells are constantly replicating, which means that the DNA

within cells is constantly replicating too.

i) Outline the process of DNA replication. (6 marks)

ii) What is meant by the term semi conservative replication? (2 marks)