

1. The diagram below represents part of the DNA molecule.

What are the parts labelled I, II and III?

	<b>I</b>	<b>II</b>	<b>III</b>
A.	hydrogen bond	base	deoxyribose
B.	hydrogen bond	deoxyribose	phosphate group
C.	covalent bond	base	deoxyribose
D.	covalent bond	deoxyribose	phosphate group

**(Total 1 mark)**

2. Which base is connected to its complementary base in a base pair by three hydrogen bonds?

- A. Uracil
- B. Thymine
- C. Guanine
- D. Adenine

**(Total 1 mark)**

3. The following diagram shows a short stretch of DNA. What bases are indicated by labels Y and Z?

	<b>Y</b>	<b>Z</b>
A.	thymine	adenine
B.	thymine	guanine
C.	uracil	guanine
D.	uracil	adenine

**(Total 1 mark)**

4. Which enzyme catalyzes the elongation of the leading strand?

[Source: image from W K Purves, *et al.*, (2003) *Life: The Science of Biology*, 4, Sinauer Associates (www.sinauer.com) and W H Freeman (www.whfreeman.com)]

- A. RNA polymerase
- B. Helicase
- C. DNA polymerase
- D. Ligase

**(Total 1 mark)**

5. What is the distinction between highly repetitive DNA sequences and single-copy genes?

- A. The highly repetitive sequences have greater amounts of guanine.
- B. The highly repetitive sequences have greater amounts of cytosine.
- C. The highly repetitive sequences are not transcribed.
- D. The highly repetitive sequences are not replicated.

**(Total 1 mark)**

6. Which molecules form the nucleotide marked in the diagram?

- A. phosphate, deoxyribose and nitrogenous base
- B. phosphorus, ribose and nitrogenous base
- C. phosphorus, deoxyribose and guanosine
- D. phosphate, ribose and guanine

**(Total 1 mark)**

7. (a) Draw a labelled diagram showing **two** different complementary pairs of nucleotides in a molecule of DNA.

(4)

- (b) Outline the structure of nucleosomes.

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(2)

(c) Explain primary structures and tertiary structures of an enzyme.

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(3)  
(Total 9 marks)

8. *Up to two additional marks are available for the construction of your answers.*

(2)

(a) Explain why DNA must be replicated before mitosis and the role of helicase in DNA replication.

(4)

(b) Explain how the base sequence of DNA is conserved during replication.

(5)

(c) Describe the events that occur during mitosis.

(9)  
(Total 20 marks)

9. *Up to two additional marks are available for the construction of your answers.*

(2)

(a) Distinguish between RNA and DNA.

(3)

(b) Explain the process of DNA replication.

(8)

(c) Outline how enzymes catalyse reactions.

(7)  
(Total 20 marks)