

APOLLO

DNA replication

HL

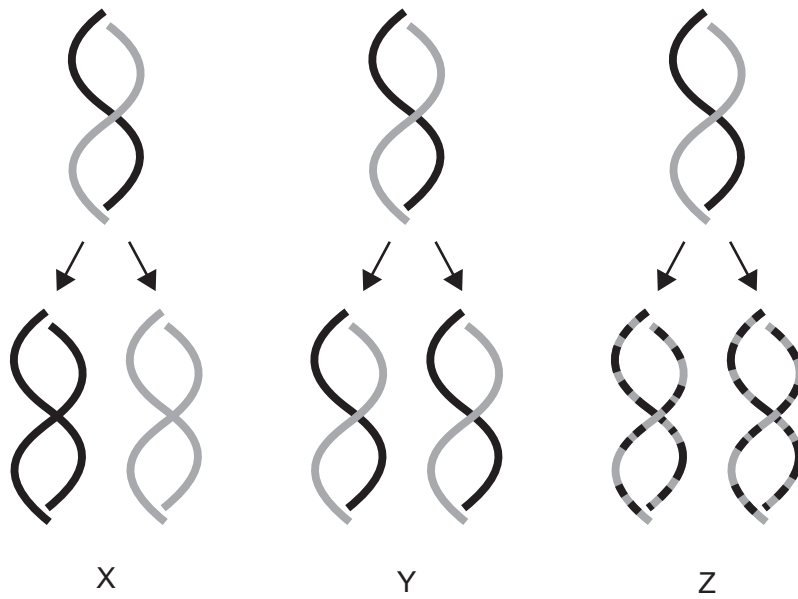
Biology

First assessment 2025

6 questions | questions

- 9.** Which enzyme is associated with proofreading during DNA replication?
- A. DNA primase
 - B. DNA helicase
 - C. DNA polymerase III
 - D. DNA ligase

9. Which diagram(s) illustrate(s) semi-conservative replication of DNA?

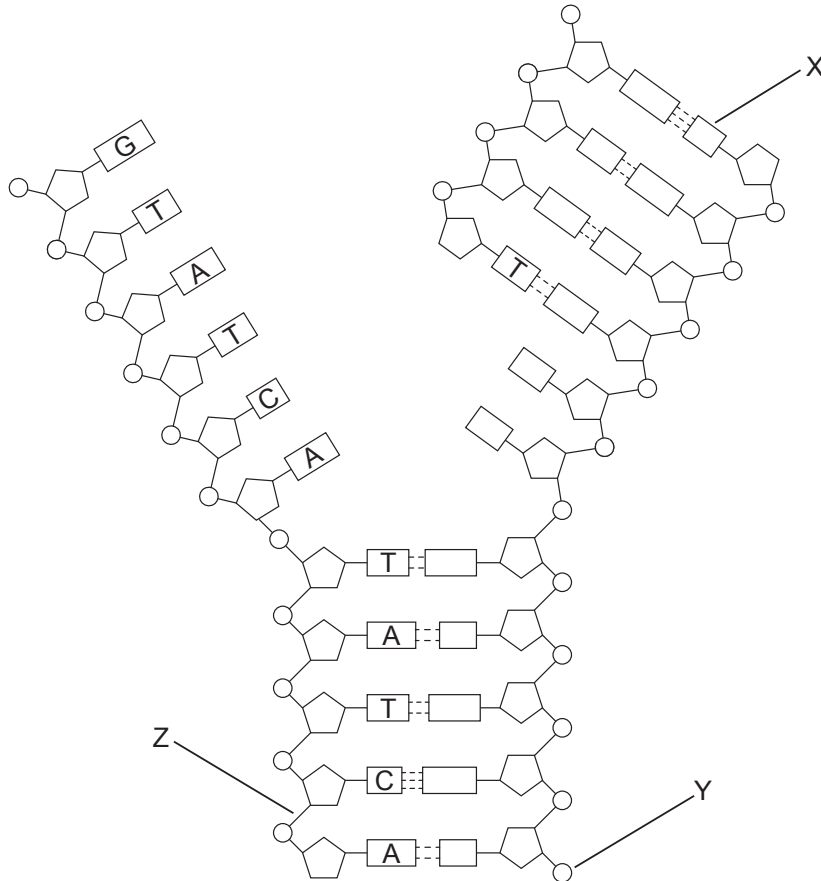


- A. X only
- B. Y only
- C. Z only
- D. X and Y only

Section A

Answer **all** questions. Answers must be written within the answer boxes provided.

3. The diagram shows a nucleic acid, with some of the bases indicated.



- (a) Identify the type of nucleic acid shown in the diagram.

[1]

.....

- (b) Determine with a reason whether the diagram shows transcription or replication.

[1]

.....

(This question continues on the following page)



(Question 3 continued)

(c) Deduce the base indicated by X on the diagram. [1]

.....

(d) Identify the terminal indicated by Y on the diagram. [1]

.....

(e) (i) Identify the type of bond indicated by Z on the diagram. [1]

.....

(ii) Several enzymes can catalyse the formation of this type of bond. Explain how **two** enzymes catalyse it during the process shown in the diagram. [2]

.....
.....
.....
.....
.....



Turn over

- 10.** DNA fragments can be amplified by the polymerase chain reaction (PCR) to obtain many identical copies that can be used in forensic investigations.

What is a function of primers in PCR?

- A. To form hydrogen bonds between complementary bases
- B. To proofread the newly synthesized DNA copies
- C. To keep double-stranded DNA fragments separated
- D. To identify the regions of DNA that need to be replicated

- 3.** Which property of DNA explains how genetic information can be replicated accurately?
- A. Complementary base pairing
 - B. The double helical shape
 - C. 5' – 3' bonding in the sugar-phosphate backbone
 - D. The ability of DNA to bind to histones

9. What is a reason that Taq polymerase is a suitable enzyme for use in the polymerase chain reaction (PCR)?
- A. It can work at a wide range of pH.
 - B. It works at higher temperatures than most enzymes.
 - C. It can separate two strands of DNA.
 - D. It allows DNA to be replicated without the use of primers.