DNA REPLICATION (HL) MC

1. **What is the primary purpose of DNA replication?**

    a) To make new cells
    b) To make identical copies of DNA
    c) To produce RNA molecules
    d) To repair damaged DNA

2. **Why must the sequence of bases remain the same during DNA replication?**

    a) To ensure genetic diversity
    b) To maintain the accuracy of genetic information
    c) To allow mutations to occur
    d) To produce complementary RNA

3. **Which of the following processes is DNA replication NOT crucial for?**

    a) Growth
    b) Embryonic development
    c) Sexual reproduction
    d) Asexual reproduction

4. **Which bonds are broken by helicase during DNA replication?**

    a) Phosphodiester bonds
    b) Hydrogen bonds
    c) Covalent bonds
    d) Ionic bonds

5. **What is the role of RNA primase in DNA replication?**

    a) Adds nucleotides in the 3’ to 5’ direction
    b) Adds an RNA primer to the DNA template
    c) Seals the gaps between Okazaki fragments
    d) Proofreads the newly synthesized DNA

6. **Why is replication on the leading strand described as continuous?**

    a) It requires no enzymes
    b) It only requires one RNA primer
    c) It occurs in the 3’ to 5’ direction
    d) It has no Okazaki fragments

7. **Why is replication on the lagging strand described as discontinuous?**

    a) It uses helicase multiple times
    b) It produces Okazaki fragments
    c) It lacks an RNA primer
    d) It synthesizes DNA in both directions

8. **Which enzyme removes RNA primers during DNA replication?**

    a) DNA polymerase I
    b) DNA polymerase III
    c) Helicase
    d) Ligase

9. **What seals the gaps between Okazaki fragments?**

    a) DNA polymerase I
    b) RNA primase
    c) DNA ligase
    d) Helicase

10. **DNA replication is described as semi-conservative because:**

    a) Half of the bases are replaced
    b) Each new molecule contains one original strand
    c) It reduces replication errors
    d) It conserves nucleotides

11. **What is the primary purpose of polymerase chain reaction (PCR)?**

    a) To repair DNA
    b) To amplify small DNA samples
    c) To produce proteins
    d) To perform gel electrophoresis

12. **During PCR, what breaks the hydrogen bonds between base pairs?**

    a) Enzymes
    b) Heating
    c) DNA polymerase
    d) Gel electrophoresis

13. **Which enzyme is used during PCR to synthesize DNA?**

    a) Helicase
    b) Taq polymerase
    c) DNA polymerase I
    d) RNA primase

14. **Why does Taq polymerase not denature at high temperatures?**

    a) It is stabilized by primers
    b) It evolved in hydrothermal vents
    c) It repairs itself
    d) It has a high replication speed

15. **What determines how DNA fragments are sorted in gel electrophoresis?**

    a) Their sequence
    b) Their size and charge
    c) Their replication rate
    d) Their base pair composition

Answers

1. b
2. b
3. c
4. b
5. b
6. b
7. b
8. a
9. c
10. b
11. b
12. d
13. b
14. c
15. b