Test Prep Pretest

1. transformation
2. genetic or hereditary
3. host or bacteria
4. diffraction
5. replication
6. replication fork
7. cell divides
8. two
9. DNA polymerases
10. translation
11. Transfer RNA or tRNA
12. DNA or tRNA anticodon
13. e
14. d
15. h
16. c
17. a
18. b
19. f
20. g
21. The base-pairing rules ensure that the sequence of nitrogenous bases on one strand determines the sequence of nitrogenous bases on the other strand. This means that DNA is made of two complementary strands of DNA.
22. Each nucleotide is made up of three parts: a phosphate group, a five-carbon sugar (deoxyribose), and a nitrogenous base.
23. The harmless R bacteria were transformed into disease-causing S bacteria, and the mice died.
24. Radioactive elements were used because they can be followed or traced. Hershey and Chase used the radioactive elements to locate the genetic material of bacteriophages after they infected bacteria.
25. DNA polymerase proceeds along the new DNA strand only if the previous nucleotide is correctly paired to its complementary base. If a mismatched nucleotide occurs, the polymerase is able to backtrack along the new DNA strand. The mismatched nucleotide is removed, and the correct nucleotide is inserted.
26. DNA helicases are enzymes that unwind the double helix of the DNA molecule. The unwinding is accomplished by breaking the hydrogen bonds that link the complementary bases.
27. RNA consists of a single strand of nucleotides instead of the two strands that form the DNA double helix. RNA nucleotides have the five-carbon sugar ribose rather than the sugar deoxyribose found in DNA nucleotides. RNA nucleotides have a nitrogenous base called uracil instead of the base thymine found in DNA nucleotides.
28. Messenger RNA (mRNA) is an RNA copy of a gene used as a blueprint for a protein. During translation, mRNA serves as a template for the assembly of amino acids. Transfer RNA (tRNA) molecules carry amino acids to the ribosome and act as interpreter molecules, translating mRNA sequences into amino acid sequences. Ribosomal RNA (rRNA) plays a structural role in ribosomes.
29. gene expression
30. transcription
31. translation
32. a
33. b

Quiz

SECTION: THE STRUCTURE OF DNA

1. a
2. c
3. a
4. d
5. b
6. c
7. a
8. b
9. d

SECTION: REPLICATION OF DNA

1. b
2. a
3. c
4. c
5. d
6. a
7. c
8. d
9. b
10. a

SECTION: RNA AND GENE EXPRESSION

1. a
2. b
3. a
4. a
5. c
6. c
7. e
8. a
9. b
10. d

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Chapter Test (Basic)

1. T
2. T
3. F
4. F
5. c
6. c
7. c
8. a
9. c
10. a
11. b
12. helix
13. Translation
14. complementary
15. intron
16. c
17. a
18. d
19. b
20. fork
21. nucleotide
22. deoxyribose
23. codon

Chapter Test (General)

1. b
2. b
3. a
4. b
5. d
6. a
7. e
8. m
9. l
10. k
11. g
12. a
13. f
14. c
15. i
16. n
17. d
18. h
19. j
20. b
21. c
22. a
23. c

Chapter Test (Advanced)

1. c
2. d
3. d
4. a
5. d
6. d
7. b
8. b
9. c
10. b
11. transformation
12. replication
13. DNA polymerase
14. diffraction
15. double helix
16. two
17. base-pairing
18. complementary
19. proofread
20. anticodons
21. uracil
22. guanine
23. translation
24. Hershey and Chase used radioactive labeling to tag bacteriophage DNA with ^{32}P and bacteriophage proteins with ^{35}S. They found that the ^{32}P label had been injected inside the bacterial cells and that the ^{35}S label had remained outside the cells. They concluded that the bacteriophages injected the DNA into the host bacterial cells but the protein remained on the outside of the cell.
25. Chargaff discovered in 1949 that in DNA, the amount of adenine always equals the amount of thymine, and the amount of cytosine always equals the amount of guanine. The X-ray diffraction photographs of DNA taken by Wilkins and Franklin in 1952 revealed a tightly coiled helix of two or three nucleotide chains.
26. Enzymes called helicases break the hydrogen bonds that hold the two complementary strands of the DNA double helix together, allowing the helix to unwind. At the replication forks, the points where the double helix separates, a molecule of DNA polymerase attaches and begins to add nucleotides to the exposed bases according to the base-pairing rules. This continues until all of the DNA is copied.
27. DNA polymerases are able to “proofread” the nucleotide sequence along the new DNA strand. The enzymes will backtrack to remove an incorrect nucleotide and replace it with the correct nucleotide.
28. A gene’s instructions for making a protein are transferred from DNA to mRNA during the process of transcription. In translation, tRNA, rRNA, and ribosomes use the instructions on the mRNA to put together the amino acids that make up the protein.

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