Chapter 8 practice

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. Which result of Frederick Griffith’s experiments led him to believe in a “transforming principle”?
   a. Mice injected with live S bacteria died.
   b. Mice injected with live R bacteria lived.
   c. Mice injected with dead S bacteria lived.
   d. Mice injected with dead S and live R bacteria died.

2. As a result of the Hershey and Chase experiments, scientists believe that
   a. radioactive isotopes can be used safely.
   b. viruses use bacterial DNA to reproduce.
   c. the "transforming principle" is DNA.
   d. bacteriophages can be grown in culture medium.

3. The four types of nucleotides that make up DNA are named for their
   a. hydrogen bonds.
   b. nitrogen-containing bases.
   c. phosphate groups.
   d. ring-shaped sugars.

4. After examining the DNA of different organisms, which of the following did Erwin Chargaff conclude about the four bases?
   a. A = T and C = G
   b. A = C = G = T
   c. A = C and G = T
   d. A + T = C + G

5. Which of the following DNA sequences is complementary to the base sequence ACCGTAT?
   a. GTTACGC
   b. UCCGTAT
   c. TGGCATA
   d. CAATGCG

6. Combining the work of other scientists with their own research, Watson and Crick discovered that two strands of DNA join together to form a(n)
   a. nucleotide.
   b. X in a circle.
   c. double helix.
   d. covalent bond.

7. What holds base pairs together?
   a. hydrogen bonds
   b. sugar-phosphate backbones
   c. pairs of double-ring nucleotides
   d. nitrogen-carbon bonds

8. What are the main functions of DNA polymerase?
   a. breaks hydrogen bonds and exposes bases
   b. holds DNA strands apart and attracts bases
   c. zips and unzips the double-stranded DNA
   d. binds nucleotides and corrects base pair errors

9. Which of the following events occurs directly after a DNA molecule is unzipped?
   a. Mismatched nucleotide bases are identified and replaced.
   b. Free-floating nucleotides pair up with exposed bases.
   c. Identical double-stranded DNA molecules are formed.
   d. Enzymes break hydrogen bonds between base pairs.

10. The process of making new DNA molecules is semiconservative. This means that every new DNA molecule is composed of
   a. two completely identical strands of DNA.
   b. one original and one new strand of DNA.
   c. one strand of DNA and one strand of RNA.
   d. two strands that mix original and new DNA.

11. When new DNA molecules are formed, almost all errors are detected and fixed by
   a. the correct nucleotide.
   b. the sugar-phosphate backbone.
   c. DNA polymerase.
   d. one DNA strand.

12. The central dogma of molecular biology states that information flows in one direction from
   a. nuclei to RNA to cytoplasm.
   b. ribosomes to proteins to DNA.
   c. genes to nuclei to ribosomes.
   d. DNA to RNA to proteins.

13. Choose the nucleotide sequence of the RNA strand that would be complementary to the following DNA strand: GTAGTCA.
   a. UATUAGA
   b. ACGACTG
   c. CAUCAGU
   d. CATACGT
14. The main function of tRNA is to
   a. carry a message that, when translated, forms proteins.
   b. form a portion of ribosomes, a cell’s protein factories.
   c. string together complementary RNA and DNA strands.
   d. bring amino acids from the cytoplasm to the ribosomes.

15. Which of the following events occurs directly after RNA polymerase recognizes the transcription start site of a gene?
   a. The polymerase strings amino acids into a polypeptide.
   b. Free-floating nucleotides pair up with exposed DNA bases.
   c. A complementary RNA strand detaches itself from the DNA.
   d. The DNA strand begins to unwind, separating the two strands.

16. A primary difference between transcription and replication is that transcription
   a. happens repeatedly throughout a single cell cycle.
   b. occurs within the nucleus of eukaryotic cells.
   c. is catalyzed by large and complex enzymes.
   d. proceeds according to careful cellular control.

17. What is the term for a three-nucleotide sequence that codes for an amino acid?
   a. base
   b. codon
   c. amine
   d. serine

18. A tRNA that carries the amino acid methionine pairs with which type of codon?
   a. serine codon
   b. tRNA codon
   c. start codon
   d. anticodon

19. Which phrase best describes translation?
   a. converts mRNA into a polypeptide
   b. catalyzes bonds between amino acids
   c. produces RNA from DNA molecules
   d. recycles tRNA molecules for reuse

20. Which of the following is the site of translation?
   a. vacuole
   b. lysosome
   c. nucleus
   d. ribosome

21. In prokaryotes, gene expression is regulated by controlling
   a. transcription.
   b. replication.
   c. translation.
   d. processing.

22. The bacterial lac operon is switched on when
   a. the operator binds to the promoter.
   b. lactose binds to the lac operon.
   c. the operator binds to the lac genes.
   d. lactose binds to the lac repressor.

23. What is the term for the nucleotide sequences that are removed during mRNA processing?
   a. operators
   b. promoters
   c. exons
   d. introns

24. Generally, mutations that affect a single gene occur during
   a. transcription.
   b. replication.
   c. translation.
   d. operation.

25. Cystic fibrosis is an example of a genetic disease caused by the deletion of a nucleotide. What is the term for this type of mutation?
   a. translocation
   b. chromosomal
   c. single-gene
   d. frameshift

26. Which type of mutation has no effect on phenotype?
   a. silent
   b. frameshift
   c. point
   d. chromosomal

27. Mutations that can affect the offspring of an organism occur in what cell type?
   a. body
   b. germ
   c. blood
   d. brain

28. Which of the following is an example of a mutagen?
   a. repair enzyme
   b. triglyceride
   c. UV sunlight
   d. thymine
Chapter 8 practice
Answer Section

MULTIPLE CHOICE

1. D
2. C
3. B
4. A
5. C
6. C
7. A
8. D
9. B
10. B
11. C
12. D
13. C
14. D
15. D
16. A
17. B
18. C
19. A
20. D
21. A
22. D
23. D
24. B
25. D
26. A
27. B
28. C