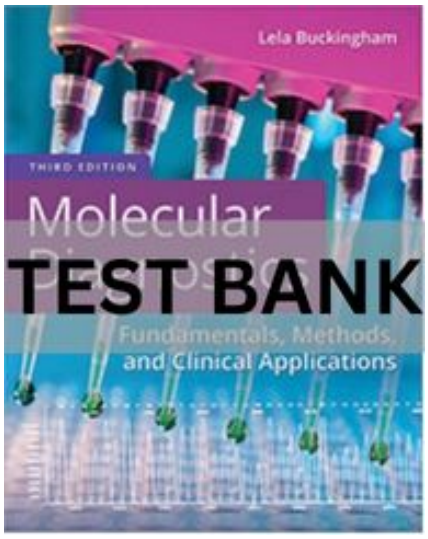
Molecular Diagnostics: Fundamentals, Methods, and Clinical Applications 3rd Edition Test Bank

Chapter 1: Nucleic Acids and Proteins



Multiple Choice

1. DNA contains deoxyribonucleotide triphosphates joined together by what type of covalent bond?

A. Aldehyde

B. Ester

C. Phosphodiester

D. Peptide

ANS: C

OBJ: 1-2

2. Nucleotides in DNA consist of which of the following?

A. Nitrogen base, deoxyribose, and phosphate

B. Nitrogen base, ribose, and sulfur

C. Carbon base, ribose, and phosphate

D. Carbon base, glucose, and carboxyl

ANS: A

OBJ: 1-1

3. Which of the five ribose carbons of the deoxyribonucleotide are involved in the formation of the DNA chain?

A. 1' and 5'

B. 2' and 4'

C. 3' and 4'

D. 3' and 5'

ANS. D

OBJ: 1-23

4. In a DNA molecule, one end has a free hydroxyl group, and one end has a free

A. phosphate group.

B. hydroxyl group.

C. amino group.

D. carboxyl group.

ANS: A

OBJ: 1-1

5. What type of bonds spontaneously form between two complementary strands of DNA?

A. Hydrogen bonds

B. Covalent bonds

C. Phosphodiester bonds

D. Polar covalent bonds

ANS: C

OBJ: 1-2

6. In a double-stranded DNA molecule, base pairing between strands occurs between

A. a purine and a purine.

B. a pyrimidine and a pyrimidine.

C. a purine and a pyrimidine.

D. all types of nucleotide bases.

ANS: C

OBJ: 1-1

7. Which of the following is a purine?

A. Thymine

B. Cytosine

C. Adenine

D. Alanine

ANS: C

OBJ: 1-1

8. Which DNA sequence is complementary to 5'GATTCTCAAAGGACT3'?

A. 5'GATTCTCAAAGGACT3'

B. 3'GATTCTCAAAGGACT5'

C. 3'CTAAGAGTTTCCTGA5'

D. 5'CTAAGAGTTTCCTGA3'

ANS: C

OBJ: 1-7

9. The term used to describe the arrangement of the individual strands in the double-stranded DNA molecule is

A. parallel.

B. antiparallel.

C. tangential.

D. divergent.

ANS: B

OBJ: 1-7

10. The process of separating the two DNA strands into two single strands is called

A. denaturation.

B. bidirectional.

C. depolymerization.

D. synthesis.

ANS: A

OBJ: 1-2

11. DNA replication is

A. conservative.

B. semiconservative.

C. nonconservative.

D. dispersive.

ANS: B

OBJ: 1-3

12. DNA replication requires the presence of

A. DNA template.

B. ribosomes.

C. amino acids.

D. messenger RNA.

ANS: A

OBJ: 1-3

13. DNA replication of the leading strand proceeds with the new daughter strand synthesized in which orientation?

A. 5' to 3'.

B. 3' to 5'.

C. Discontinuously.

D. Either 5' to 3' or 3' to 5'.

ANS: A

OBJ. 1-7

14. In DNA replication, the leading strand is copied in which direction?

A. Reading goes 5′ to 3′.

B. Reading goes 3′ to 5′.

C. Both strands are leading.

D. Reading proceeds from the -OP to the -OH end.

ANS: B

OBJ: 1-7

15. The lagging DNA strand is synthesized discontinuously, producing

A. Kornberg fragments.

B. Southern fragments.

C. Okazaki fragments.

D. Klenow fragments.

ANS: C

OBJ: 1-3

16. Which of the following accounts for maintenance of DNA sequence information?

A. RNA primase

B. Deoxynucleotide structure

C. Semiconservative replication

D. DNA polymerase activity

ANS: C

OBJ: 1-3

17. In DNA synthesis, where does replication begin and end?

A. Origin of replication; end of the molecule

B. Promoter; termination site

C. Start codon; stop codon

D. Start codon; termination site

ANS: A

OBJ: 1-3

18. Which of the following enzymes will untangle DNA?

A. Polymerase

B. Helicase

C. Kinase

D. Phosphatase

ANS: B

OBJ: 1-8

19. Restriction endonucleases are enzymes that are produced by bacteria and

A. degrade viral proteins.

B. digest DNA.

C. have no laboratory applications.

D. degrade lipids.

ANS: B

OBJ: 1-8

20. Enzymes that recognize palindromic sequences of DNA, that are cut within the recognition sequence, that do not have methylating activity, and that are used frequently in the laboratory are which type of restriction enzymes?

A. Type I

B. Type II

C. Type III

D. Type IV

ANS: B

OBJ: 1-8

21. Which of the following is a type II restriction enzyme recognition site?

A. GAATTC

B. GAATTG

C. GAAAAG

D. GATCAG

ANS: A

OBJ:1-8

22. An exonuclease will catalyze what type of reaction?

A. Polymerization of nucleotides into long strands

B. Separation of complementary DNA strands

C. Dissociation of phosphodiester bonds at the ends of DNA molecules

D. Formation of circular DNA molecules from linear ones

ANS: C

OBJ: 1-8

23. What reactions are catalyzed by DNA methyltransferase?

A. Addition of methyl groups to nitrogen bases

B. Addition of methyl groups to ribose sugars

C. Addition of methyl groups to proteins

D. Removal of methyl groups from DNA

ANS: A

OBJ: 1-8

24. The purpose of ligase is to

A. synthesize DNA.

B. cut DNA within the double helix.

C. chew DNA from the ends.

D. paste two ends of DNA together.

ANS: D