

# TEST BANK FOR

Biochemistry 9th Edition by Lubert Stryer, Jeremy Berg, John Tymoczko, Gregory Gatto

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## Chapter 1-36

### Chapter 1 Biochemistry: An Evolving Science

#### Multiple-Choice Questions

- 1) DNA is made from the building blocks adenine, guanine, cytosine and \_\_\_\_\_.  
A) uridine  
B) thymine  
C) inosine  
D) ribose  
E) None of the answers is correct.

Answer: B

Section: 1.2

- 2) The DNA backbone is made from repeating \_\_\_\_\_.  
A) monosaccharide units  
B) amino acid units  
C) sugar-phosphate units  
D) fatty acid  
E) None of the answers is correct.

Answer: C

Section: 1.2

- 3) The number of hydrogen bonds formed between A and T is \_\_\_\_\_.  
A) 1  
B) 2  
C) 3  
D) 4  
E) 2 if in DNA, 3 if in RNA

Answer: B

Section: 1.2

- 4) The number of hydrogen bonds formed between G and C is \_\_\_\_\_.
- A) 1
  - B) 2
  - C) 3
  - D) 4
  - E) 2 if in RNA, 3 if in DNA

Answer: C

Section: 1.2

- 5) The fundamental groups of organisms include Eukarya, Bacteria, and \_\_\_\_\_.
- A) Plantae
  - B) Animalia
  - C) Protista
  - D) Archaea
  - E) Fungi

Answer: D

Section: 1.1

- 6) Which of the following are the strongest bonds in molecules?
- A) covalent bonds
  - B) ionic bonds
  - C) hydrogen bonds
  - D) metallic bonds
  - E) None of the answers is correct.

Answer: A

Section: 1.1

7) Which of the following describes the relationship between the strengths of hydrogen and covalent bonds?

- A) Hydrogen bonds are always stronger than covalent bonds.
- B) Hydrogen bonds and covalent bonds have equivalent strength.
- C) Hydrogen bonds are always weaker than covalent bonds.
- D) With a few exceptions, most hydrogen bonds are stronger than covalent bonds.
- E) With a few exceptions, most covalent bonds are stronger than hydrogen bonds.

Answer: C

Section: 1.3

8) The matter within a defined region of space is referred to as the \_\_\_\_\_.

- A) universe
- B) system
- C) outer space
- D) wormhole
- E) None of the answers is correct.

Answer: B

Section: 1.3

9) For a spontaneous reaction, the  $\Delta G$  must be \_\_\_\_\_.

- A) positive
- B) negative
- C) greater than 1
- D) between 1 and 0
- E) 0

Answer: B

Section: 1.3

10) The term \_\_\_\_\_ is used to indicate Gibbs free energy.

- A)  $\Delta H$

- B)  $\Delta E$
- C)  $\Delta S$
- D)  $\Delta G$
- E)  $\Delta T$

Answer: D

Section: 1.3

11) Which of the following is considered a metabolite, a substance that is chemically transformed in a biochemical process?

- A) deoxyribonucleic acid
- B) glycerol
- C) protein
- D) ribonucleic acid
- E) polysaccharide

Ans: B

Section: 1.1

12) The structure of DNA described by Watson and Crick included

- A) a double helix.
- B) the sugar phosphate backbone aligned in the center of the helix.
- C) the base pairs that are stacked on the inside of the double helix.
- D) both a double helix and the sugar phosphate backbone aligned in the center of the helix
- E) a double helix and the base pairs that are stacked on the inside of the double helix

Ans: E

Section: 1.2

13) What did Watson and Crick suggest to be significant about the base pairing found in the helix?

- A) It allowed the DNA to twist in a helix.
- B) The DNA could be circular.
- C) It was a mechanism for copying.

- D) All of the answers are correct.
- E) None of the answers is correct.

Ans: C

Section: 1.3

14) Approximately what percentage of the human genome encodes proteins?

- A) 50%
- B) 90%
- C) 20%
- D) 3%
- E) None of the answers is correct.

Ans: D

Section: 1.4

15) What gives proteins such a dominant role in biochemistry?

- A) the rigidity of the peptide backbone
- B) the ability to act as a blueprint
- C) the ability to self-replicate
- D) the ability to spontaneously fold into complex three-dimensional structures
- E) All of the answers are correct.

Ans: D

Section: 1.4

16) If the whole chain is used in a nonoverlapping frame, how many amino acids are defined by this DNA sequence: ATGTTTGGACTA?

- A) two
- B) three
- C) four
- D) six
- E) twelve

Ans: C Section: 1.4

17) What is the  $[H^+]$  concentration in a urine sample that has a pH of 6?

- A)  $10^{-6}$  M
- B)  $10^{-8}$  M
- C)  $10^6$  M
- D)  $10^{-14}$  M
- E) 6 M

Ans: A

Section 1.3

- 18) Which is the correct order of decreasing bond strengths?
- A) hydrogen bonds, covalent bonds, van der Waals interactions
  - B) hydrogen bonds, electrostatic interactions, covalent bonds
  - C) van der Waals interactions, covalent bonds, hydrogen bonds
  - D) covalent bonds, hydrogen bonds, van der Waals interactions
  - E) hydrophobic interactions, hydrogen bonds, electrostatic interactions

Ans: D

Section: 1.3

- 19) The energies for hydrogen bonds are approximately
- A)  $400 \text{ kJ mol}^{-1}$ .
  - B)  $100\text{--}240 \text{ kJ mol}^{-1}$ .
  - C)  $4\text{--}20 \text{ kJ mol}^{-1}$ .
  - D)  $200 \text{ kJ mol}^{-1}$ .
  - E) None of the answers is correct.

Ans: C

Section: 1.3

- 20) Which of the following is a hydrogen bond donor?
- A) the N in N—HD
  - B) the H in S—H
  - C) the O in P—O
  - D) the H in O—H
  - E) None of the answers is correct.

Ans: D

Section: 1.3

- 21) Typical van der Waals energies are about
- A)  $4\text{--}20 \text{ kJ mol}^{-1}$ .