Chapter 5 (Nucleic Acid)/8 Quiz

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

____ 1. Which organic molecule below is most closely related to lipids?
   a. nucleotides  
   b. amino acids  
   c. CH₂ chains

____ 2. Which organic molecule below is most closely related to nucleic acids?
   a. nucleotides  
   b. sugars  
   c. CH₂ chains

____ 3. Nucleic acids include
   a. glucose and glycogen.  
   b. lipids and sugars.  
   c. DNA and RNA.

____ 4. A model of enzyme action is the
   a. active site model.  
   b. activator action model.  
   c. induced fit model.

____ 5. Without enzymes, the chemical reactions in the body would
   a. occur too slowly to support life processes.  
   b. require a different pH.  
   c. occur at much the same rate as they do with enzymes.

____ 6. Enzymes that break down DNA catalyze the hydrolysis of the covalent bonds that join nucleotides together. What would happen to DNA molecules treated with these enzymes?
   a. The phosphodiester bonds between deoxyribose sugars would be broken.  
   b. The two strands of the double helix would separate.  
   c. The pyrimidines would be separated from the deoxyribose sugars.

____ 7. Choose the pair of terms that correctly completes this sentence:
   Catabolism is to anabolism as _____ is to _____.
   a. exergonic; endergonic  
   b. work; energy  
   c. free energy; entropy

____ 8. If an enzyme solution is saturated with substrate, the most effective way to obtain an even faster yield of products is to
   a. add more of the enzyme.  
   b. heat the solution to 90°C.  
   c. add an allosteric inhibitor.

____ 9. If an enzyme is added to a solution where its substrates and products are in equilibrium, what would occur?
   a. The reaction would change from endergonic to exergonic.  
   b. Additional product would be formed.  
   c. Nothing; the reaction would stay at equilibrium.
10. Which of these is a difference between DNA and RNA?
   a. DNA contains thymine; RNA contains uracil.
   b. In DNA, adenine pairs with guanine; in RNA, adenine pairs with thymine.
   c. DNA consists of five different nucleotides; RNA consists of four different nucleotides.

11. What name is given to the reactants in an enzymatically catalyzed reaction?
   a. products
   b. substrate
   c. $E_A$

12. Which of the following are nitrogenous bases of the pyrimidine type?
   a. thymine and guanine
   b. cytosine and uracil
   c. guanine and adenine

13. Which of the following are nitrogenous bases of the purine type?
   a. guanine and adenine
   b. uracil and cytosine
   c. cytosine and guanine

14. A double-stranded DNA molecule contains a total of 120 purines and 120 pyrimidines. This DNA molecule could be comprised of
   a. 240 adenine and 240 cytosine molecules.
   b. 120 thymine and 120 adenine molecules.
   c. 240 guanine and 240 thymine molecules.

15. In the double helix structure of nucleic acids, cytosine hydrogen bonds to
   a. ribose.
   b. guanine.
   c. adenine.

16. The structural feature that allows DNA to replicate is the
   a. twisting of the molecule to form an α helix.
   b. sugar-phosphate backbone.
   c. complementary pairing of the nitrogenous bases.

17. Which of the following describe(s) some aspect of metabolism?
   a. synthesis of macromolecules
   b. breakdown of macromolecules
   c. control of enzyme activity
   d. A and B only
   e. A, B, and C

18. Which term most precisely describes the cellular process of breaking down large molecules into smaller ones?
   a. catalysis
   b. catabolism
   c. anabolism

19. According to the first law of thermodynamics,
   a. the universe loses energy because of heat production.
   b. systems rich in energy are intrinsically unstable and will give up energy with time.
   c. energy can be neither created nor destroyed.
   d. A and B only
   e. A, B, and C

20. How can one increase the rate of a chemical reaction?
   a. Add a catalyst.
   b. Increase the entropy of the reactants.
   c. Decrease the concentration of the reactants.
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Answer Section

MULTIPLE CHOICE

1. ANS: C  PTS: 1  DIF: 2  OBJ: 3-2.4
2. ANS: A  PTS: 1  DIF: 1  OBJ: 3-2.5
3. ANS: C  PTS: 1  DIF: 1  OBJ: 3-2.5
4. ANS: C  PTS: 1  DIF: 1  OBJ: 3-2.3
5. ANS: A  PTS: 1  DIF: 1  OBJ: 3-2.3
6. ANS: A  PTS: 1
7. ANS: A  PTS: 1
8. ANS: A  PTS: 1
9. ANS: C  PTS: 1
10. ANS: A  PTS: 1  TOP: Web/CD Activity: Nucleic Acid Structure
12. ANS: B  PTS: 1  TOP: Concept 5.5
13. ANS: A  PTS: 1  TOP: Concept 5.5
14. ANS: B  PTS: 1  TOP: Concept 5.5
15. ANS: B  PTS: 1  TOP: Concept 5.5
16. ANS: C  PTS: 1  TOP: Concept 5.5
17. ANS: E  PTS: 1  TOP: Concept 8.1
18. ANS: B  PTS: 1  TOP: Concept 8.1
19. ANS: C  PTS: 1  TOP: Concept 8.1
20. ANS: A  PTS: 1  TOP: Concept 8.4