

Ch. 5 Quiz

- 1) What is the chemical mechanism by which cells make polymers from monomers? 1) \_\_\_\_\_  
A) dehydration synthesis  
B) hydrolysis  
C) the formation of disulfide bridges between monomers  
D) digestion  
E) ionic bonding of monomers
- 2) Which of the following best summarizes the relationship between dehydration reactions and hydrolysis? 2) \_\_\_\_\_  
A) polymer synthesis occurs through the removal of water and digestion occurs through the addition of water.  
B) Dehydration synthesis reactions assemble polymers, and hydrolysis reactions break down polymers.  
C) Dehydration synthesis reactions can occur only after hydrolysis.  
D) Hydrolysis creates monomers, and dehydration reactions break down polymers.  
E) A and B are correct.
- 3) The molecular formula for glucose is  $C_6H_{12}O_6$ . What would be the molecular formula for a molecule made by linking three glucose molecules together by dehydration reactions? 3) \_\_\_\_\_  
A)  $C_{18}H_{36}O_{18}$   
B)  $C_{18}H_{30}O_{15}$   
C)  $C_3H_6O_3$   
D)  $C_6H_{10}O_5$   
E)  $C_{18}H_{10}O_{15}$
- 4) On food packages, to what does the term "insoluble fiber" refer? 4) \_\_\_\_\_  
A) cellulose  
B) amylopectin  
C) chitin  
D) polypeptides  
E) starch
- 5) A molecule with the chemical formula  $C_6H_{12}O_6$  is probably a 5) \_\_\_\_\_  
A) monosaccharide  
B) carbohydrate.  
C) lipid.  
D) amino acid  
E) A and B,

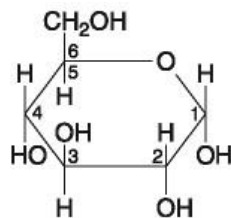


Figure 5.1



- 12) Which of the following statements is true regarding the molecule illustrated in Figure 5.2? 12) \_\_\_\_\_
- A) It is a saturated fatty acid.
  - B) A diet rich in this molecule may contribute to atherosclerosis, heart disease and stroke.
  - C) Molecules of this type are usually liquid at room temperature.
  - D) A and B only
  - E) A, B and C

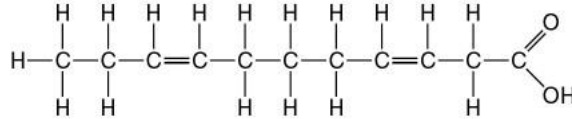


Figure 5.3

- 13) Which of the following statements is true regarding the molecule illustrated in Figure 5.3? 13) \_\_\_\_\_
- A) A diet rich in this molecule may contribute to atherosclerosis and heart disease.
  - B) It is a saturated fatty acid and solid at room temperature.
  - C) It is an unsaturated fatty acid and the are usually liquid at room temperature.
  - D) A and B only
  - E) A, B and C

- 14) All of the following contain amino acids except 14) \_\_\_\_\_
- A) hemoglobin.
  - B) enzymes.
  - C) insulin.
  - D) antibodies.
  - E) cholesterol.

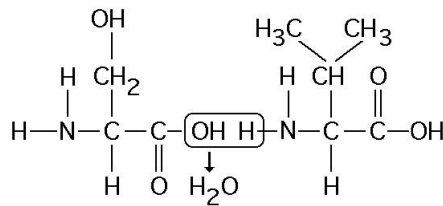


Figure 5.5

- 15) Which of the following statements is/are true regarding the chemical reaction illustrated in Figure 5.5? 15) \_\_\_\_\_
- A) It results in a peptide bond.
  - B) It joins two fatty acids together.
  - C) It is a hydrolysis reaction.
  - D) A and B only
  - E) A, B, and C
- 16) Polysaccharides, lipids, and proteins are similar in that they 16) \_\_\_\_\_
- A) are synthesized as a result of peptide bond formation between monomers.
  - B) are decomposed into their subunits by dehydration synthesis reactions.
  - C) are synthesized from monomers by the process of hydrolysis.
  - D) are synthesized from monomers by dehydration synthesis reactions.
  - E) all contain nitrogen in their monomer building blocks.

- 17) Upon chemical analysis, a particular polypeptide was found to contain 100 amino acids. How many peptide bonds are present in this protein?  
A) 100      B) 98      C) 97      D) 99      E) 101      17) \_\_\_\_\_
- 18) Which bonds are created by ribosomes during the formation of the primary structure of a protein during ?  
A) peptide bonds  
B) hydrogen bonds  
C) phosphodiester bonds  
D) disulfide bonds  
E) A, B, and C      18) \_\_\_\_\_
- 19) What maintains the secondary structure of a protein?  
A) hydrogen bonds  
B) phosphodiester bonds  
C) peptide bonds  
D) ester bonds  
E) glycolytic bonds      19) \_\_\_\_\_
- 20) The tertiary structure of a protein is the  
A) unique three-dimensional shape of the fully folded polypeptide.  
B) bonding together of several polypeptide chains by weak bonds.  
C) overall protein structure resulting from the aggregation of two or more polypeptide subunits.  
D) organization of a polypeptide chain into an  $\alpha$  helix or  $\beta$  pleated sheet.  
E) order in which amino acids are joined in a polypeptide chain.      20) \_\_\_\_\_
- 21) What would be an unexpected consequence of changing one amino acid in a protein consisting of 325 amino acids?  
A) The primary structure of the protein would be changed.  
B) The biological activity or function of the protein might be altered.  
C) The tertiary structure and shape of the active site of the protein might be changed.  
D) Only A and C are correct.  
E) A, B, and C are correct.      21) \_\_\_\_\_
- 22) The function of each protein is a consequence of its specific shape. What is the term used for a change in a protein's three-dimensional shape or conformation due to disruption of hydrogen bonds by an increase in the protein's temperature?  
A) protein activation energy  
B) denaturation  
C) stabilization  
D) dehydration synthesis  
E) hydrolysis      22) \_\_\_\_\_
- 23) Which of the following *best* describes the general flow of information in eukaryotic cells?  
A) DNA  $\rightarrow$  RNA  $\rightarrow$  proteins  
B) DNA  $\rightarrow$  proteins  $\rightarrow$  RNA  
C) proteins  $\rightarrow$  DNA  $\rightarrow$  RNA  
D) RNA  $\rightarrow$  DNA  $\rightarrow$  proteins  
E) RNA  $\rightarrow$  proteins  $\rightarrow$  DNA      23) \_\_\_\_\_

- 24) Which of the following descriptions *best* fits the class of molecules known as nucleotides? 24) \_\_\_\_\_
- A) a nitrogenous base and a pentose sugar
  - B) a nitrogenous base and a phosphate group
  - C) a pentose sugar and a purine or pyrimidine
  - D) a nitrogenous base, a phosphate group, and a pentose sugar
  - E) a phosphate group and an adenine or uracil
- 25) In the double helix structure of nucleic acids, cytosine hydrogen bonds to 25) \_\_\_\_\_
- A) adenine.
  - B) thymine.
  - C) guanine.
  - D) ribose.
  - E) deoxyribose.
- 26) If one strand of a DNA molecule has the sequence of bases 5'ATTGCA3', the other complementary strand would have the sequence 26) \_\_\_\_\_
- A) 3'UAACGU5'.
  - B) 5'UAACGU3'.
  - C) 5'UGCAAU3'.
  - D) 3'TAACGT5'.
  - E) 5'TAACGT3'.
- 27) What is the structural feature that allows DNA to easily replicate? 27) \_\_\_\_\_
- A) disulfide bonding (bridging) of the two helices
  - B) three-component structure of the nucleotides
  - C) sugar-phosphate backbone
  - D) complementary pairing of the nitrogenous bases
  - E) twisting of the molecule to form an  $\alpha$  helix

The following questions are based on the 15 molecules illustrated in Figure 5.8. Each molecule may be used once, more than once, or not at all.

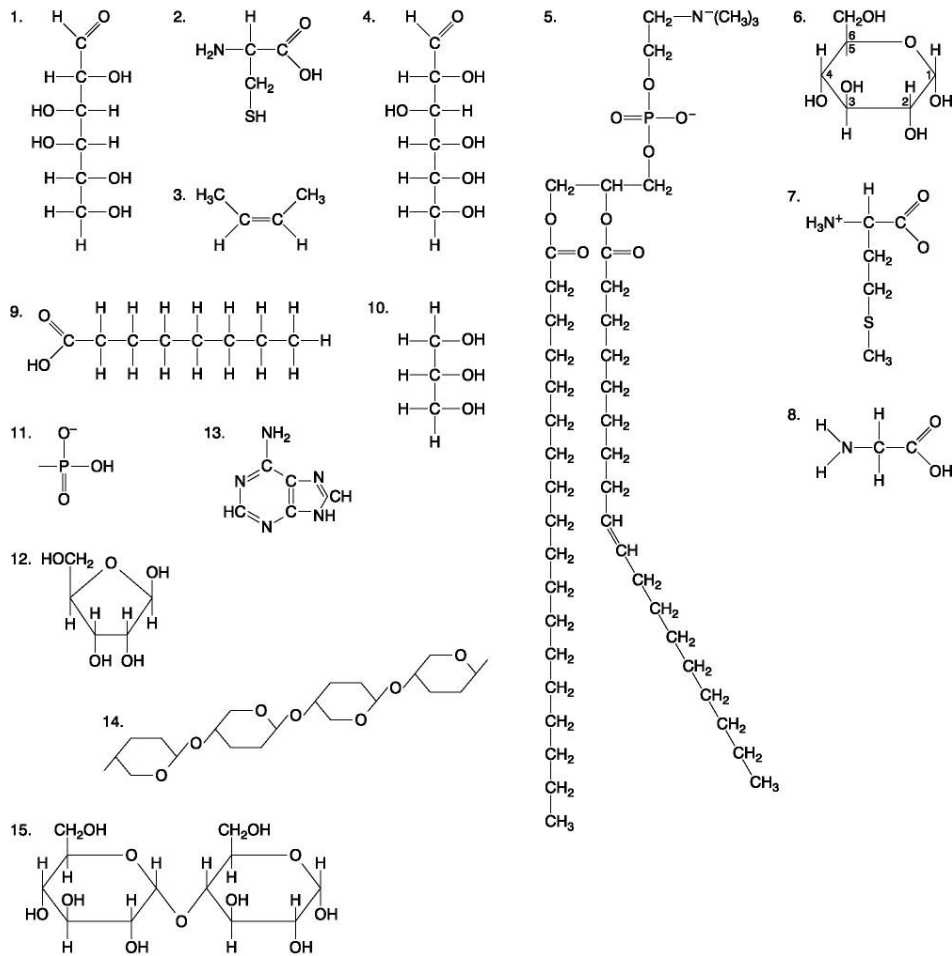


Figure 5.8

- 28) Which molecule in Fig. 5.8 is a phospholipid with hydrophilic head and hydrophobic tails and would form the basis of cell membranes? 28) \_\_\_\_\_  
 A) 1                      B) 14                      C) 12                      D) 6                      E) 5
- 29) Which of the molecules in Fig. 5.8 is a nitrogenous base? 29) \_\_\_\_\_  
 A) 5                      B) 13                      C) 3                      D) 12                      E) 2
- 30) Which of the molecules in Fig. 5.8 act as building blocks (monomers) of polypeptides? 30) \_\_\_\_\_  
 A) 11, 12, and 13  
 B) 7, 8, and 13  
 C) 1, 4, and 6  
 D) 2, 7, and 8  
 E) 12, 13, and 15
- 31) Which of the molecules in Fig. 5.8 is ribose, the pentose sugar found in RNA? 31) \_\_\_\_\_  
 A) 12                      B) 4                      C) 13                      D) 1                      E) 6
- 32) Which of the molecules in Fig. 5.8 is a disaccharide containing a glycosidic linkage type of covalent bond? 32) \_\_\_\_\_  
 A) 13                      B) 15                      C) 6                      D) 12                      E) 4