

### **CHAPTER 3.5—3.6: Nucleic Acids and Chemical Evolution**

1. What are the building blocks of nucleic acids? \_\_\_\_\_

2. Briefly describe two functions of DNA in the cell.

a. \_\_\_\_\_  
\_\_\_\_\_

b. \_\_\_\_\_  
\_\_\_\_\_

3. List and describe three other forms of nucleotides and their functions:

a. \_\_\_\_\_  
\_\_\_\_\_

b. \_\_\_\_\_  
\_\_\_\_\_

c. \_\_\_\_\_  
\_\_\_\_\_

4. What was the Miller/Urey experiment and what was its significance?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

5. What information might link RNA as the first biological catalyst?

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\_\_\_\_\_  
\_\_\_\_\_

**END OF CHAPTER 3 MULTIPLE CHOICE**

1. The most abundant molecule in the cell is
  - A) a carbohydrate.
  - B) a lipid.
  - C) a nucleic acid.
  - D) a protein.
  - E) water.
  
2. All lipids are
  - A) triglycerides.
  - B) polar.
  - C) hydrophilic.
  - D) polymers of fatty acids.
  - E) more soluble in nonpolar solvents than in water.
  
3. All carbohydrates
  - A) are polymers.
  - B) are simple sugars.
  - C) consist of one or more simple sugars.
  - D) are found in biological membranes.
  - E) are more soluble in nonpolar solvents than in water.
  
4. Which of the following is not a carbohydrate?
  - A) Glucose
  - B) Starch
  - C) Cellulose
  - D) Hemoglobin
  - E) Deoxyribose
  
5. All proteins
  - A) are enzymes.
  - B) consist of one or more polypeptide chains.
  - C) are amino acids.
  - D) have quaternary structures.
  - E) are more soluble in nonpolar solvents than in water.

6. Which of the following statements about the primary structure of a protein is not true?
- A) It may be branched.
  - B) It is determined by the structure of the corresponding DNA.
  - C) It is unique to that protein.
  - D) It determines the tertiary structure of the protein.
  - E) It is the sequence of amino acids in the protein.
7. The amino acid leucine
- A) is found in all proteins.
  - B) cannot form peptide linkages.
  - C) is hydrophobic.
  - D) is hydrophilic.
  - E) is identical to the amino acid lysine.
8. The quaternary structure of a protein
- A) consists of four subunits—hence the name quaternary.
  - B) is unrelated to the function of the protein.
  - C) may be either alpha or beta.
  - D) depends on covalent bonding among the subunits.
  - E) depends on the primary structures of the subunits.
9. All nucleic acids
- A) are polymers of nucleotides.
  - B) are polymers of amino acids.
  - C) are double-stranded.
  - D) are double-helical.
  - E) contain deoxyribose.
10. Which of the following statements about condensation reactions is not true?
- A) Protein synthesis results from them.
  - B) Polysaccharide synthesis results from them.
  - C) Nucleic acid synthesis results from them.
  - D) They consume water as a reactant.
  - E) Different condensation reactions produce different kinds of macromolecules.