**1. Molecules with which functional groups may form polymers via dehydration reactions?**A) hydroxyl groups B) carbonyl groups C) carboxyl groups

**Chapter 5: Biological Molecules**

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D) either carbonyl or carboxyl groups E) either hydroxyl or carboxyl groups

**2. Which of these molecules is not formed by dehydration reactions?**A) fatty acids B) disaccharides C) DNA D) protein E) amylose

**3. Which of these classes of biological molecules consist of both small molecules and macromolecular polymers?**

A) lipids B) carbohydrates C) proteins D) nucleic acids E) lipids,

**4. Which of the following is not a polymer?**A) glucose B) starch C) cellulose D) chitin E) DNA

**5. How many molecules of water are needed to completely hydrolyze a polymer that is 11 monomers?**A) 12 B) 11 C) 10 D) 9 E) 8

**6. Which of the following polymers contain nitrogen?**A) starch B) glycogen C) cellulose D) chitin E) amylopectin

**7. The molecular formula for glucose is C₆H₁2O₆. What would be the molecular formula for a molecule made by linking three glucose molecules together by dehydration reactions?**A) C₁₈H₃₆O₁₈ B) C₁₈H₃₂O₁₆ C) C₆H₁₀O₅ D) C1₈H₁₀O₁₅ E) C₃H₆O₃

**8. On food packages, to what does the term insoluble fiber refer?**A) cellulose B) polypeptides C) starch D) amylopectin E) chitin

**9. A molecule with the chemical formula C₆H₁₂O₆ is probably a**A) carbohydrate. B) lipid. C) monosaccharide D) carbohydrate and lipid only.
E) carbohydrate and monosaccharide only.

**10. Lactose, a sugar in milk, is composed of one glucose molecule joined by a glycosidic linkage to one galactose molecule. How is lactose classified?**A) as a pentose B) as a hexose C) as a monosaccharide D) as a disaccharide

**11. All of the following are polysaccharides except**A) lactose. B) glycogen. C) chitin. D) cellulose. E) amylopectin.



**12. Which of the following statements is true regarding the molecule illustrated in the figure above?**A) It is a saturated fatty acid.
B) A diet rich in this molecule may contribute to atherosclerosis.
C) Molecules of this type are usually liquid at room temperature.
D) It is a saturated fatty acid and a diet rich in this molecule may contribute to atherosclerosis.

**13. Which of the following statements concerning unsaturated fats is true?**A) They are more common in animals than in plants.
B) They have double bonds in the carbon chains of their fatty acids.
C) They generally solidify at room temperature.
D) They contain more hydrogen than do saturated fats having the same number of carbon atoms.
E) They have fewer fatty acid molecules per fat molecule.

**14. The molecular formula for glucose is C₆H₁₂O₆. What would be the molecular formula for a polymer made by linking ten glucose molecules together by dehydration reactions?**A) C₆₀H₁₂₀O₆₀ B) C₆H₁₂O₆ C) C₆₀H₁₀₂O₅₁ D) C₆₀H₁₀₀O₅₀ E) C₆₀H₁₁₁O₅₁

**15. There are 20 different amino acids. What makes one amino acid different from another?**A) different side chains (R groups) attached to a carboxyl carbon
B) different side chains (R groups) attached to the amino groups
C) different side chains (R groups) attached to an α carbon
D) different structural and optical isomers
E) different asymmetric carbons

**16. Upon chemical analysis, a particular polypeptide was found to contain 100 amino acids. How many peptide bonds are present in this protein?**A) 101 B) 100 C) 99 D) 98 E) 97

**17. Which bonds are created during the formation of the primary structure of a protein?**A) peptide bonds B) hydrogen bonds C) disulfide bonds D) phosphodiester bonds

**18. Which level of protein structure do the α helix and the β pleated sheet represent?**A) primary B) secondary C) tertiary D) quaternary

**19. What type of covalent bond between amino acid side chains (R groups) functions in maintaining a polypeptide's specific three-dimensional shape?**A) ionic bond B) hydrophobic interaction C) van der Waals interaction D) disulfide bond

**20. At which level of protein structure are interactions between the side chains (R groups) most important?**A) primary B) secondary C) tertiary D) quaternary E) all of the above

**21. If cells are grown in a medium containing radioactive ³⁵S, which of these molecules will be labeled?**A) phospholipids B) nucleic acids C) proteins D) amylose

**22. Which of the following are nitrogenous bases of the pyrimidine type?**A) guanine and adenine B) cytosine and uracil C) thymine and guanine D) ribose and deoxyribose

**23. Which of the following are nitrogenous bases of the purine type?**A) cytosine and guanine B) guanine and adenine C) adenine and thymine D) thymine and uracil

**24. The difference between the sugar in DNA and the sugar in RNA is that the sugar in DNA**A) is a six-carbon sugar and the sugar in RNA is a five-carbon sugar.
B) can form a double-stranded molecule.
C) is an aldehyde sugar and the sugar in RNA is a keto sugar.
D) is in the α configuration and the sugar in RNA is in the β configuration.
E) contains one less oxygen atom.

**25 If cells are grown in a medium containing radioactive ¹⁵N, which of these molecules will be labeled?**A) fatty acids only B) nucleic acids only C) proteins only D) E) both proteins and nucleic acids