

1. Which type of lipid is most important in biological membranes?

- fats
- steroids
- phospholipids
- oils
- triglycerides

(a) Structural formula (b) Space-filling model (c) symbol (d) lipid bilayer symbol

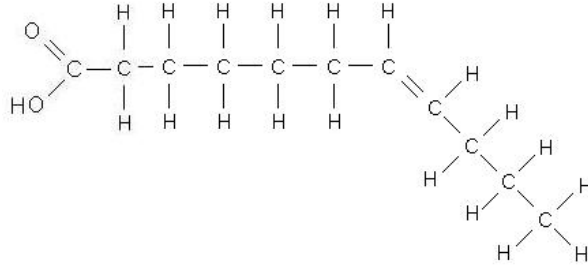
2. Polymers of carbohydrates, lipids, and proteins and nucleic acids are all synthesized from monomers by chemical reactions that

- connect monosaccharides together.
- add water to the polymer and split off a monomer by breaking a covalent bond (hydrolysis).
- remove a water and covalently bond a monomer to the end of a growing polymer (dehydration synthesis).
- form ionic bonds between monomers.
- form disulfide bridges between monomers.

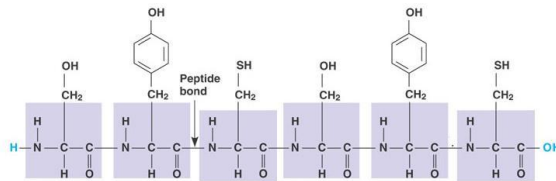
3. Which of the following statements best summarizes structural differences between DNA and RNA?

- RNA is a protein while DNA is a nucleic acid.
- DNA is not a polymer, but RNA is.
- DNA is double stranded, RNA is single stranded, substitutes Uracil for Thymine, and Ribose sugar for Deoxyribose.
- Both DNA and RNA are found as double helices in nature.
- DNA has uracil and RNA has thymine and RNA uses Ribose sugar instead of Deoxyribose.

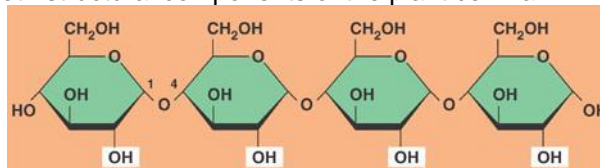
4. What is the molecule illustrated at right?
- a saturated fatty acid
  - an unsaturated fatty acid
  - a polyunsaturated triglyceride
  - likely to be a common component of plant oils
  - similar in structure to a steroid



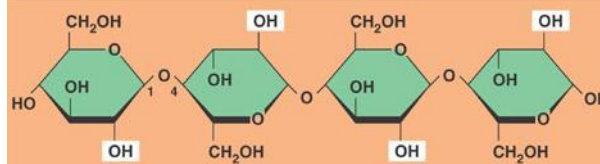
5. What is the structure shown below?
- a starch molecule
  - a steroid
  - a protein
  - a cellulose molecule
  - a nucleic acid polymer



6. Which of the following is true both of starch and of cellulose?
- They are both polymers of glucose.
  - They are geometric isomers of each other.
  - They can both be digested by humans.
  - They are both used for energy storage in plants.
  - They are both structural components of the plant cell wall.



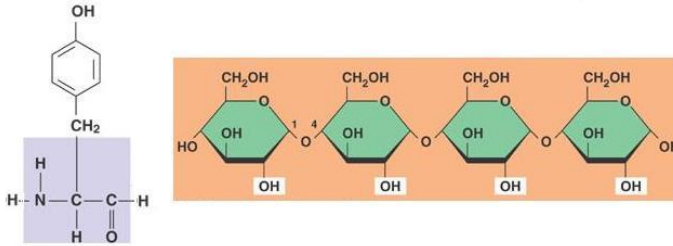
(b) Starch: 1-4 linkage of  $\alpha$  glucose monomers



(c) Cellulose: 1-4 linkage of  $\beta$  glucose monomers

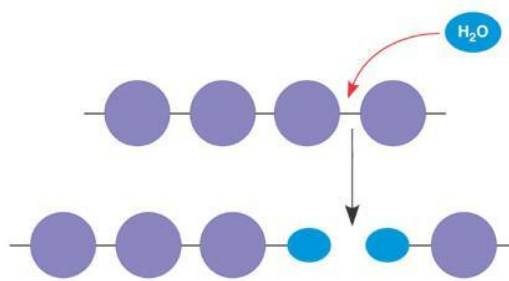
7. Which of the following is true of an amino acid and starch?

- a. Both contain nitrogen.
- b. Both contain oxygen.
- c. Both are polymers.
- d. Both are hydrophobic.
- e. Both are found in proteins



8. Hydrolysis is involved in which of the following?

- a. formation of starch
- b. hydrogen bond formation between nucleic acids
- c. peptide bond formation of proteins
- d. the hydrophilic interactions of lipids
- e. the digestion of a polysaccharide into monosaccharides

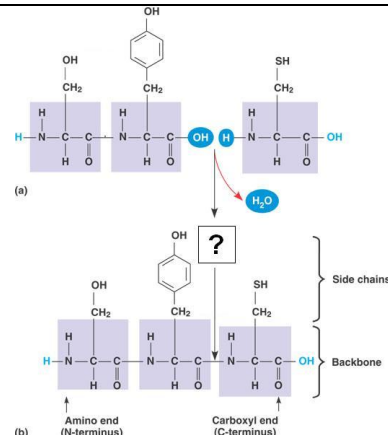


9. Carbohydrates normally function in animals as

- a. the functional units of lipids.
- b. enzymes in the regulation of metabolic processes.
- c. a component of cell membranes.
- d. a source of energy.
- e. sites of protein synthesis.

10. The chemical reactions illustrated in figure at right results in the formation of

- a. peptide bonds.
- b. ionic bonds.
- c. a glyosidic bond.
- d. a hydrogen bond.
- E. an isotope.

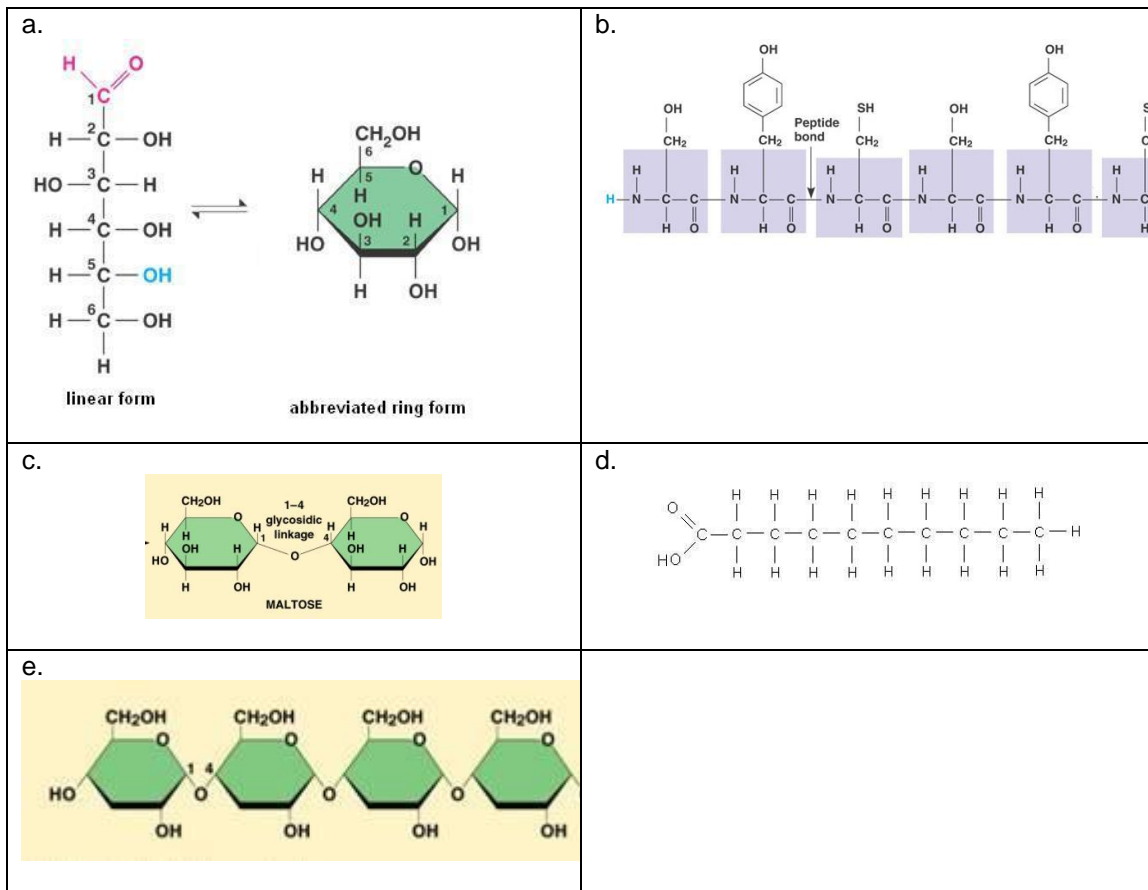


11. Dehydration synthesis reactions are used in forming which of the following compounds?

- a. triglycerides
- b. polysaccharides
- c. proteins
- d. Only triglycerides and proteins are correct.
- e. triglycerides, polysaccharides, and proteins

12. In the double helix structure of nucleic acid, cytosine hydrogen bonds to
- deoxyribose
  - ribose
  - adenine
  - thymine
  - guanine
13. If one strand of a DNA molecule has the sequence of bases 5'-ATTGCA-3', the other strand would have the sequence
- 3'-TAACGT-5'
  - 3'-TCCCGT-5'
  - 3'-TUUCGU-5'
  - 3'-TAAGCT-5'
  - 3'-TUUGCU-5'
14. The element nitrogen is present in all of the following EXCEPT
- proteins.
  - nucleic acids.
  - amino acids.
  - DNA.
  - lipids.
15. All of the following molecules are proteins EXCEPT
- hemoglobin.
  - antibodies.
  - collagen.
  - enzymes.
  - DNA.
16. All of the following bases are found in DNA EXCEPT
- thymine.
  - adenine.
  - uracil.
  - guanine.
  - cytosine.
17. All of the following molecules are carbohydrates EXCEPT
- lactose.
  - cellulose.
  - hemoglobin and muscle fibers.
  - glycogen.
  - starch.
18. Upon chemical analysis, a particular protein was found to contain 438 amino acids. How many peptide bonds are present in this protein?
- 20
  - 437
  - 438
  - 439
  - 876

19. Of the following organic molecules which contains the most calories per gram?
- carbohydrate
  - protein
  - fat
  - all foods contain the same
  - sugar



Which of the above molecules is a:

- protein
  - starch
  - monosaccharide
  - disaccharide
24. Which is not a carbohydrate and not a lipid?
25. Which is a polysaccharide?

END