

f. What would cause a protein to have a quaternary shape? \_\_\_\_\_

19. <sup>a</sup> \_\_\_\_\_ proteins help new proteins fold into their normal shape. In Creutzfeldt-Jakob disease, an infectious protein called a(an) <sup>b</sup> \_\_\_\_\_ is misfolded resulting in disease.

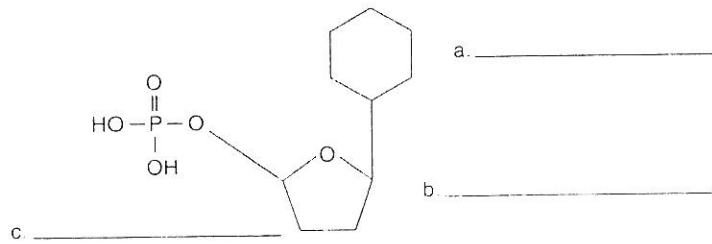
### 3.5 NUCLEIC ACIDS (PR. 50-52)

- Genes are composed of DNA (deoxyribonucleic acid). DNA specifies the correct ordering of amino acids in proteins, with RNA as an intermediary.
- The nucleotide ATP serves as a carrier of chemical energy in cells.

20. Both DNA and RNA are polymers of \_\_\_\_\_.

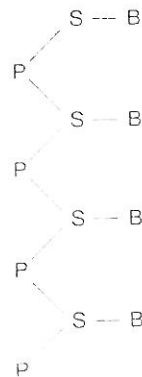
21. On the following diagram, label the components of a nucleotide.

nitrogen-containing base  
phosphate  
pentose sugar



22. Refer to the following diagram of a strand of nucleotides to answer questions *a-d*.

- a. What molecule is represented by S? \_\_\_\_\_
- b. What molecule is represented by B? \_\_\_\_\_
- c. How many different types of B are in DNA? \_\_\_\_\_
- d. What type of bond is represented by the lines? \_\_\_\_\_



23. a. Complete the following table to distinguish DNA from RNA:

|                     | DNA | RNA |
|---------------------|-----|-----|
| Sugar               |     |     |
| Bases               |     |     |
| Strands (how many?) |     |     |
| Helix (yes or no)   |     |     |

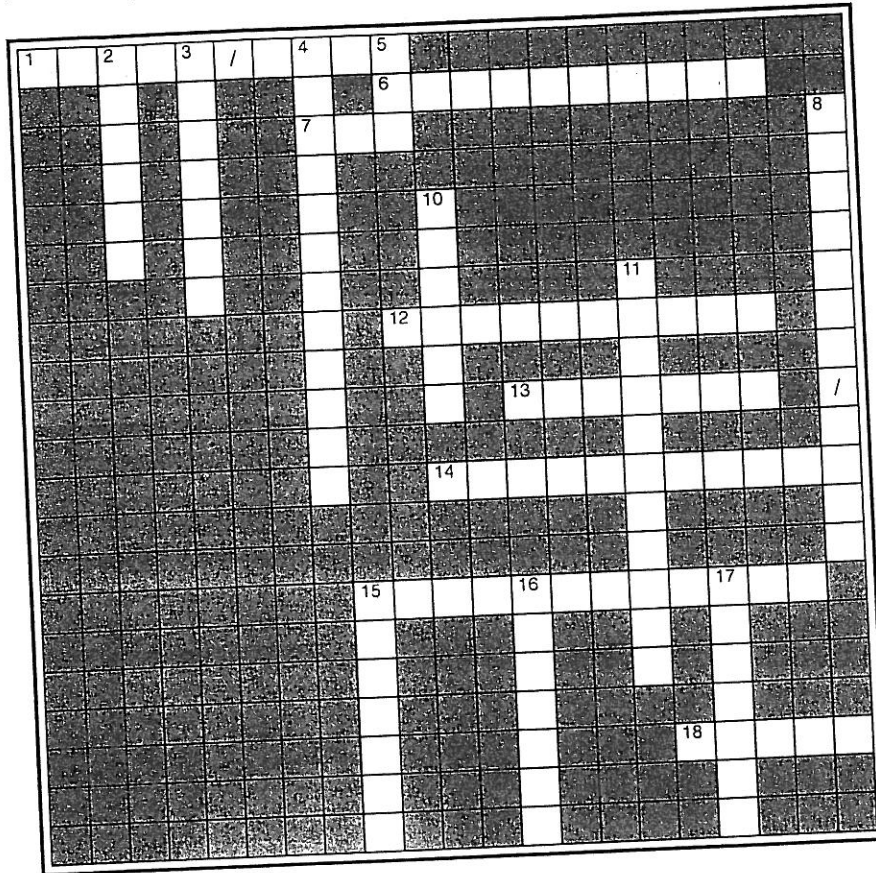
b. What are the functions of DNA and RNA? \_\_\_\_\_  
\_\_\_\_\_

### ATP (Adenosine Triphosphate) (p. 52)

24. ATP is a(n) <sup>a.</sup> \_\_\_\_\_; its structure consists of three <sup>b.</sup> \_\_\_\_\_ groups attached to <sup>c.</sup> \_\_\_\_\_, the pentose sugar.
25. Complete this reaction:  $ATP \rightarrow ADP + \textcircled{P} +$  <sup>a.</sup> \_\_\_\_\_. When cells need <sup>b.</sup> \_\_\_\_\_, they break down the molecule <sup>c.</sup> \_\_\_\_\_.

# KEYWORD CROSSWORD

Review key terms by completing this crossword puzzle, using the following alphabetized list of terms:



amino acid  
 carbohydrate  
 DNA  
 enzyme  
 hydrolysis  
 hydrophilic  
 hydrophobic  
 isomer  
 lipid  
 nucleic acid  
 nucleotide  
 organic  
 peptide  
 phospholipid  
 polymer  
 protein  
 RNA  
 steroid

## Across

- 1 Organic molecule that has an amino group and an acid group, and that covalently bonds to produce protein molecules (two words)
- 6 Monomer of DNA and RNA consisting of a five-carbon sugar bonded to a nitrogen-containing base and a phosphate group
- 7 Nucleic acid polymer produced from covalent bonding of nucleotide monomers that contain the sugar ribose; carries information for protein synthesis from DNA
- 12 Splitting of a compound by the addition of water, with the  $H^+$  being incorporated in one fragment and the  $OH^-$  in the other
- 13 Type of lipid molecule having four interlocking rings; examples are cholesterol, estrogen, and testosterone
- 14 Type of molecule that does not interact with water because it is nonpolar
- 15 Molecule having the same structure as a fat except that a group that contains phosphate replaces one bonded fatty acid; an important component of plasma membranes
- 18 Class of organic compounds that tend to be soluble in nonpolar solvents such as alcohol; includes fats and oils

## Down

- 2 Molecule with the same molecular formula (as another molecule) but a different structure, and therefore shape
- 3 Type of molecule that contains carbon and hydrogen; it usually also contains oxygen
- 4 Class of organic compounds consisting of carbon, hydrogen, and oxygen atoms; includes monosaccharides, disaccharides, and polysaccharides
- 5 Nucleic acid polymer produced from covalent bonding of nucleotide monomers that contain the sugar deoxyribose; the genetic material of nearly all organisms
- 8 Polymer of nucleotides; includes both DNA and RNA (two words)
- 10 Organic catalyst, usually a protein molecule, that speeds chemical reactions in living systems
- 11 Type of molecule that interacts with water by dissolving in water or by forming hydrogen bonds with water molecules
- 15 Macromolecule consisting of covalently bonded monomers
- 16 A polymer having, as its primary structure, a sequence of amino acids united through covalent bonding
- 17 A few amino acids joined by covalent bonding