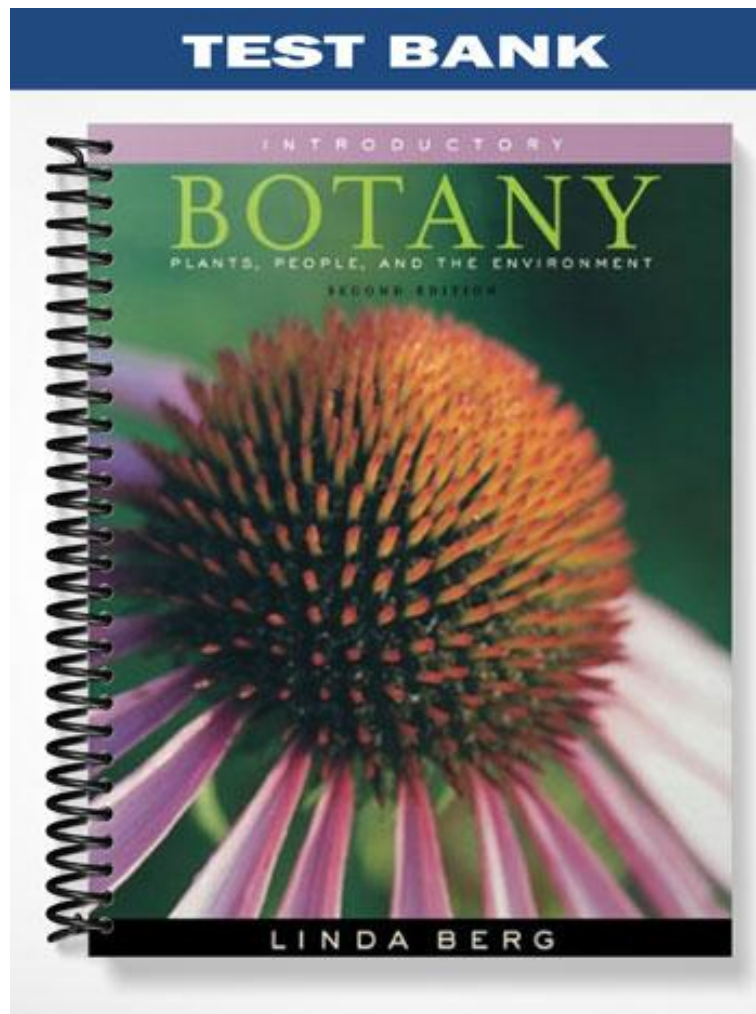


TEST BANK



INTRODUCTORY

BOTANY

PLANTS, PEOPLE, AND THE ENVIRONMENT

SECOND EDITION

LINDA BERG

Chapter 2--The Chemical Composition of Cells

1. The mass number of an atom is determined by
 - A. the combined number of all its protons and neutrons.
 - B. the combined number of all its isotopes.
 - C. the number of all its electrons.
 - D. the number of all its neutrons.
 - E. the number of all its protons.
2. Atoms that have the same number of protons but different numbers of neutrons are called...
 - A. compounds.
 - B. elements.
 - C. ions.
 - D. inorganic.
 - E. isotopes.
3. When two atoms share a pair of electrons, a(n) ____ bond is formed.
 - A. hydrogen
 - B. ionic
 - C. covalent
 - D. double
 - E. single
4. When ions are attracted to one another by opposite electrical charges, a(n) ____ bond is formed.
 - A. covalent
 - B. double
 - C. hydrogen
 - D. ionic
 - E. single
5. A special covalent bond, called a(n) ____ bond, links two amino acids together.
 - A. amino
 - B. double
 - C. peptide
 - D. polar
 - E. none of these

6. Which of the following properties is exhibited by water?
- A. adhesion
 - B. capillary action
 - C. cohesion
 - D. hydrogen bonding
 - E. all of these
7. The large and complex carbon-containing molecules found in living things are called...
- A. foods.
 - B. functional molecules.
 - C. living molecules.
 - D. organic molecules.
 - E. nutrients.
8. The smallest general kind of carbohydrate is called _____.
- A. monosaccharides
 - B. simple sugars
 - C. starch
 - D. simple sugars or starch
 - E. none of these are correct
9. _____ is an example of a structural carbohydrate found in plants.
- A. Cellulose
 - B. Disaccharide
 - C. Sucrose
 - D. Sugar
 - E. Starch
10. Fats and oils are structurally made of one, two or three fatty acid molecules connected to a single "backbone" molecule of _____.
- A. amino acids
 - B. cholesterol
 - C. glucose
 - D. fatty acids
 - E. glycerol
11. Proteins are large compounds made up of smaller units called
- A. amino acids
 - B. fats
 - C. fatty acids
 - D. glucose
 - E. nucleotides

12. A nucleotide, the repeating subunit that makes up a nucleic acid, is composed of which three smaller building blocks?
- A. A 6-carbon sugar, a phosphate, and a fatty acid.
 - B. A 6-carbon sugar, a phosphate, and a nitrogenous base.
 - C. A 5-carbon sugar, a phosphate, and a nitrogenous base.
 - D. A 5-carbon sugar, a phosphate, and an enzyme.
 - E. None of these.
13. A(n) _____ is a long molecule of repeating subunits called nucleotides.
- A. protein
 - B. ATP
 - C. DNA
 - D. nucleic acid
 - E. ATP and DNA
14. The most common atoms in living things are hydrogen and oxygen, bonded together in molecules of _____.
- A. fats.
 - B. sugars.
 - C. proteins.
 - D. water.
 - E. none of these.
15. The second law of thermodynamics implies that in every energy conversion, some energy is lost, usually as _____.
- A. light
 - B. electricity
 - C. motion
 - D. heat
 - E. none of these
16. The _____ is the location on an enzyme where the substrate attaches.
- A. reaction plate
 - B. substrate place
 - C. active site
 - D. thermal core
 - E. allosteric site
17. The _____ is the energy required to get a reaction started.
- A. activation energy
 - B. thermodynamics
 - C. potential energy
 - D. kinetic energy
 - E. none of these

18. An atom's ability to combine with other atoms is determined by the number of electrons in its inner energy level.
- True False
19. When an atom absorbs energy, one or more of its electrons move from a lower to a higher energy level.
- True False
20. Since hydrogen bonds are weak compared to covalent bonds, they really are not very important in biological systems.
- True False
21. The pH of a plant cell can change a great deal, and the chemical reactions within will still take place.
- True False
22. Few organisms can digest cellulose.
- True False
23. Gram for gram, fats contain more than twice as much energy as carbohydrates.
- True False
24. A single enzyme can control a variety of different reactions.
- True False
25. The order of amino acids in a protein determines its structure and function.
- True False
26. The energy present in the universe decreases over time.
- True False
27. Proteins are important structural molecules in cells.
- True False
28. The _____ of water is the primary characteristic that causes it to be a good solvent.
- _____
29. A substance when added to pure water dissociates and results in a solution with a pH of 4.9. The general name for that kind of substance is _____.
- _____

30. A substance when added to pure water dissociates and results in a solution with a pH of 8.9. The general name for that kind of substance is _____.
- _____
31. The basic units of carbohydrates are made up of the atoms C, H and O, in the ratio _____.
- _____
32. The first energy level of an atom can hold a maximum of _____ electrons.
- _____
33. _____ are carbohydrates made up of two monosaccharides linked together.
- _____
34. _____ are carbohydrates made up of many monosaccharides linked together.
- _____
35. When a fatty acid contains one or more double bonds in its hydrocarbon chain, it is said to be _____.
- _____
36. Lipids all share the characteristic that they are not soluble in _____.
- _____
37. The first law of thermodynamics states that energy cannot be created or destroyed, but only _____ in form.
- _____
38. Energy is defined as the capacity to _____.
- _____
39. The second law of thermodynamics implies that in every system the _____ is increasing.
- _____

40. What is the biological importance of the evaporation of water?

41. What does "essential amino acids" mean?

42. How are nucleic acids used in the cell?

43. What do we mean when we call ATP the "energy currency" of cells?

Chapter 2--The Chemical Composition of Cells **Key**

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18. An atom's ability to combine with other atoms is determined by the number of electrons in its inner energy level.
- FALSE**
19. When an atom absorbs energy, one or more of its electrons move from a lower to a higher energy level.
- TRUE**
20. Since hydrogen bonds are weak compared to covalent bonds, they really are not very important in biological systems.
- FALSE**
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- TRUE**
26. The energy present in the universe decreases over time.
- FALSE**
27. Proteins are important structural molecules in cells.
- TRUE**
28. The _____ of water is the primary characteristic that causes it to be a good solvent.
- polarity**

29. A substance when added to pure water dissociates and results in a solution with a pH of 4.9. The general name for that kind of substance is _____.

acid

30. A substance when added to pure water dissociates and results in a solution with a pH of 8.9. The general name for that kind of substance is _____.

base

31. The basic units of carbohydrates are made up of the atoms C, H and O, in the ratio _____.

1:2:1

32. The first energy level of an atom can hold a maximum of _____ electrons.

2

33. _____ are carbohydrates made up of two monosaccharides linked together.

Disaccharides

34. _____ are carbohydrates made up of many monosaccharides linked together.

Polysaccharides

35. When a fatty acid contains one or more double bonds in its hydrocarbon chain, it is said to be _____.

unsaturated

36. Lipids all share the characteristic that they are not soluble in _____.

water

37. The first law of thermodynamics states that energy cannot be created or destroyed, but only _____ in form.

changed

38. Energy is defined as the capacity to _____.

do work

39. The second law of thermodynamics implies that in every system the _____ is increasing.

entropy, disorder

40. What is the biological importance of the evaporation of water?

It takes a lot of energy to break the hydrogen bonds in liquid water for its molecules to change from liquid to vapor. That energy is carried with each water molecule as it escapes from the liquid. The removal of energy, in the form of heat, from the liquid and any surfaces associated with it, has a cooling effect.

41. What does "essential amino acids" mean?

The essential amino acids are those that animals, including humans, cannot manufacture and must obtain in their diets.

42. How are nucleic acids used in the cell?

The nucleic acids are DNA and RNA. Together, they control all the life processes of an organism and store and transmit the hereditary information from one generation to another.

43. What do we mean when we call ATP the "energy currency" of cells?

ATP provides biologically usable energy to power virtually every cellular reaction.