

Chapter 02: Chemistry of Life
VanMeter: Microbiology for the Healthcare Professional, 2nd Edition

MULTIPLE CHOICE

1. The atomic number equals the number of
- protons.
 - neutrons.
 - electrons.
 - protons and neutrons.

ANS: A REF: p. 20

2. The atomic weight is equal to the sum of
- neutrons.
 - protons and neutrons.
 - neutrons and electrons.
 - electrons.

ANS: B REF: p. 20

3. The smallest units of matter are
- molecules.
 - atoms.
 - protons.
 - compounds.

ANS: B REF: p. 20

4. Protons are
- located in the shells.
 - part of the atomic nucleus.
 - negatively charged.
 - uncharged particles.

ANS: B REF: p. 20

5. Particles of an atom located in the outermost shell and available for chemical bonding are called
- valence electrons.
 - isotopes.
 - excess electrons.
 - neutrons.

ANS: A REF: p. 21

6. Isotopes are atoms with
- the same number of electrons and protons.
 - different numbers of protons and electrons.
 - the same numbers of protons but a different number of neutrons.
 - different numbers of electrons.

ANS: C REF: p. 21

7. A chemical bond in which electrons are equally shared is a(n)
- ionic bond.
 - polar covalent bond.
 - nonpolar covalent bond.
 - hydrogen bond.

ANS: C REF: p. 23

8. The transfer of electrons in a chemical bond represents a(n)
- ionic bond.
 - polar covalent bond.
 - nonpolar covalent bond.
 - hydrogen bond.

ANS: A REF: p. 24

9. The bond of oxygen and hydrogen between water molecules is a(n)
- ionic bond.
 - polar covalent bond.
 - nonpolar covalent bond.
 - hydrogen bond.

ANS: D REF: p. 24

10. The isotope deuterium has
- one proton.
 - one proton and one neutron.
 - one proton and two neutrons.
 - one proton and three neutrons.

ANS: B REF: p. 21

11. After filling the first shell, the outermost shell of an atom can hold up to _____ electrons.
- 2
 - 6
 - 8
 - 10

ANS: C REF: p. 23

12. The bond between sodium and chlorine atoms in sodium chloride is a(n)
- hydrogen bond.
 - ionic bond.
 - polar covalent bond.
 - nonpolar covalent bond.

ANS: B REF: p. 24

13. Sucrose is composed of

- a. glucose and galactose.
- b. glucose and fructose.
- c. fructose and maltose.
- d. glucose and maltose.

ANS: B REF: p. 31

14. The unit molecules (monomers) of carbohydrates are
- a. monosaccharides.
 - b. amino acids.
 - c. nucleic acids.
 - d. fatty acids.

ANS: A REF: p. 31

15. The bond between amino acids is a(n)
- a. ionic bond.
 - b. peptide bond.
 - c. hydrogen bond.
 - d. covalent bond.

ANS: B REF: p. 32

16. Glucose and fructose are examples of
- a. monosaccharides.
 - b. disaccharides.
 - c. polysaccharides.
 - d. lipids.

ANS: A REF: p. 31

17. Two glucose molecules form
- a. galactose.
 - b. lactose.
 - c. maltose.
 - d. fructose.

ANS: C REF: p. 31

18. Starch is an example of a
- a. monosaccharide.
 - b. polysaccharide.
 - c. peptide.
 - d. protein.

ANS: B REF: p. 31

19. Cytosine always undergoes complementary base pairing with
- a. adenine.
 - b. guanine.
 - c. thymine.
 - d. uracil.

ANS: B

REF: p. 36

20. The RNA nucleotide base that pairs with adenine of DNA is
- cytosine.
 - guanine.
 - thymine.
 - uracil.

ANS: D

REF: p. 36

COMPLETION

1. Neutrons are _____ charged particles.

ANS: not

REF: p. 20

2. An atom with the same number of protons but a different number of neutrons is called a(n) _____.

ANS: isotope

REF: p. 21

3. A positively charged ion is a(n) _____.

ANS: cation

REF: p. 22

4. The breakdown of large molecules into smaller ones in the presence of water is called _____.

ANS: hydrolysis

REF: p. 25

5. Molecules that can absorb hydrogen ions and not change the pH of the substance are _____.

ANS: buffers

REF: p. 28

6. The formation of polymers from simpler substances is referred to as _____.

ANS: synthesis

REF: p. 25

7. When the solute concentration outside a cell is the same as the concentration inside the cell, the solution is called _____.

ANS: isotonic

REF: p. 29

8. The monomers of triglycerides are _____ and fatty acids.

ANS: glycerol

REF: p. 31

9. Lactose is composed of glucose and _____.

ANS: galactose

REF: p. 31

10. Chemically, ATP is a(n) _____.

ANS: nucleic acid

REF: p. 38

MATCHING

Match the description below with the correct item from this list.

- a. Redox
 - b. Electron
 - c. Neutron
 - d. Acid
 - e. Base
 - f. Salt
 - g. Glucose
 - h. Protein
 - i. Polysaccharide
 - j. Nucleic acid
 - k. Lipid
 - l. Tritium
-
- 1. Radioactive isotope
 - 2. Negatively charged particle
 - 3. Reduction–oxidation reactions
 - 4. Hydrogen ion donor
 - 5. Ammonium chloride
 - 6. Monomer
 - 7. Cellulose
 - 8. Particle with no charge
 - 9. Prostaglandin

10. Amino acid chain

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|------------|------------|
| 1. ANS: L | REF: p. 22 |
| 2. ANS: B | REF: p. 20 |
| 3. ANS: A | REF: p. 25 |
| 4. ANS: D | REF: p. 27 |
| 5. ANS: F | REF: p. 28 |
| 6. ANS: G | REF: p. 31 |
| 7. ANS: I | REF: p. 31 |
| 8. ANS: C | REF: p. 20 |
| 9. ANS: K | REF: p. 33 |
| 10. ANS: H | REF: p. 32 |