Chapter 2

1. The 92 basic substances that all matter is made of are called:

   A. cells
   B. elements
   C. atomic symbols
   D. isotopes
   E. electrons

2. An element can be easily identified by the number of:

   A. electrons
   B. protons
   C. neutrons
   D. bonds

3. Ninety percent of the human body is composed of just four elements. They are:

   A. carbon, hydrogen, sulfur, calcium
   B. oxygen, silicon, carbon, nitrogen
   C. carbon, hydrogen, oxygen, nitrogen
   D. hydrogen, oxygen, magnesium, carbon

4. Two or more atoms that combine are defined as:

   A. atomic units
   B. a molecule
   C. a compound
   D. an isotope
   E. an ion
5. A covalent bond is:
   A. an example of a bond that results in ionic compounds
   B. the transfer of electrons from one atom to another
   C. a sharing of electrons between two atoms
   D. an attraction of charged atoms

6. What types of bonds are found between amino acids?
   A. peptide
   B. ionic
   C. hydrogen
   D. atomic

7. The nucleus of an atom is composed of:
   A. protons
   B. neutrons
   C. electrons
   D. protons and neutrons
   E. All of the choices are correct.

8. An electrically neutral atom will have equal numbers of:
   A. electrons and neutrons
   B. protons and neutrons
   C. electrons and protons

9. The atomic number of an atom indicates the number of:
   A. protons
   B. electrons
   C. neutrons

10. In diagnosing a thyroid tumor, a scan of the thyroid is done after giving the patient:
    A. a radioactive isotope
    B. radioactive iodine
    C. non-radioactive iodine
    D. carbohydrate
    E. both a radioactive isotope that is radioactive iodine
11. Isotopes of an element differ from each other in:

A. mass
B. number of neutrons
C. number of electrons
D. number of neutrons and protons

12. Which of the following is an ion?

A. \( \text{H}_2\text{O} \)
B. \( \text{O}_2 \)
C. \( \text{H}^+ \)

13. Water (H2O) is an example of a(n):

A. molecule
B. compound
C. ion
D. a molecule and a compound

14. An atom with an atomic number of 12 needs to have how many electrons to be electrically neutral?

A. 6
B. 9
C. 12
D. 24

15. Isotopes of a given element have:

A. the same atomic number but different atomic masses
B. the same atomic mass but a different atomic number
C. different atomic numbers and masses
D. the same number of neutrons

16. The difference between 12C and 14C is:

A. 2 electrons
B. 2 protons
C. 2 neutrons
D. 2 carbon atoms
E. 2 ionic bonds
17. If an atom becomes a positive ion, it:

A. gains electrons  
B. loses electrons  
C. gains protons  
D. loses protons

18. Hydrogen bonding in water causes the water to:

A. boil at a lower temperature than expected  
B. be less dense as ice than as liquid water  
C. absorb heat with large immediate change in temperature  
D. release heat with large immediate change in temperature  
E. shrink as temperature approaches 0°C

19. Choose the CORRECT statement(s) concerning water.

A. Water is a polar molecule.  
B. Water is the most abundant molecule in the body.  
C. 60-70% of total body weight of most organisms is water.  
D. Due to hydrogen bonding, water molecules are cohesive.  
E. All of the choices are correct.

20. Choose the CORRECT statement concerning water.

A. Water is the universal solvent, especially for polar molecules.  
B. The temperature of liquid water rises and falls quickly.  
C. Water has a low heat of vaporization.  
D. Liquid water is less dense than frozen water.  
E. All of the choices are correct.

21. In a basic solution:

A. the number of OH\(^-\) is less than the number of H\(^+\)  
B. the number of OH\(^-\) is greater than the number of H\(^+\)  
C. the number of H\(^+\) is equal to the number of OH\(^-\)  
D. the number of H\(^+\) is greater than the number of OH\(^-\)
22. The pH of blood is slightly basic. Which of the following pH numbers most closely reflects normal blood pH?

A. 4.6  
B. 6.4  
C. 6.8  
D. 7.4  
E. 13.8

23. A buffer:

A. stabilizes chemical charges  
B. equalizes ion concentrations  
C. resists changes in pH  
D. speeds up chemical reactions  
E. None of the choices are correct.

24. Which of the following is an organic molecule?

A. HCl  
B. H₂  
C. C₆H₁₂O₆  
D. NaOH

25. Joining small molecules (monomers) together to form longer chains (polymers) requires a process called:

A. hydrolysis  
B. dehydration reaction  
C. monomerization  
D. emulsification  
E. None of the choices are correct.

26. The storage form of glucose in plants is:

A. glycogen  
B. starch  
C. hexose  
D. pyruvic acid  
E. None of the choices are correct.
27. The storage form of glucose in animals is:

A. glycogen  
B. starch  
C. hexose  
D. pyruvic acid  
E. None of the choices are correct.

28. The polysaccharide found in plant cell walls is:

A. cellulose  
B. phospholipid  
C. steroid  
D. cholesterol  
E. None of the choices are correct.

29. Cellulose is a polymer of:

A. sucrose  
B. glucose  
C. galactose  
D. maltose

30. Which of the following are disaccharides?

A. glucose, ribose  
B. sucrose, maltose  
C. starch, glycogen

31. A long chain of single carbon atoms with hydrogens attached, and ending in an acid group, would represent:

A. an amino chain  
B. a fatty acid  
C. steroid molecule
32. Steroids are composed of:

A. four fused carbon rings  
B. protein based strands  
C. phospholipids  
D. fatty acids

33. Most enzymes are classified as:

A. carbohydrates  
B. proteins  
C. lipids  
D. nucleic acids

34. Which of the following molecules is a polymer of nucleotides?

A. cellulose  
B. DNA  
C. cholesterol  
D. RNA  
E. DNA and RNA

35. Which of the following combinations are found in a nucleotide?

A. base-acid-salt  
B. adenine-thymine-uracil  
C. phosphate group-sugar-nitrogen base  
D. DNA-RNA-protein

36. The building blocks of a nucleic acid are:

A. amino acids  
B. nucleotides  
C. glycerol  
D. carboxylic acids
37. Which of the following is considered single-stranded in human cells?

A. RNA  
B. DNA  
C. ATP  
D. glucose

38. Which of the following molecules are monomers?

A. phospholipids, polypeptides, nucleic acids  
B. starch, glycogen, steroids  
C. RNA, enzymes, waxes  
D. glucose, amino acids, fatty acids

39. A pH of 2 is ____ times as strong as a pH of 5:

A. 10  
B. 100  
C. 1000  
D. 10000

40. Hemoglobin, antibodies and keratin are similar in that they are all:

A. lipids  
B. carbohydrates  
C. proteins  
D. steroids  
E. nucleic acids

41. High levels of radiation can:

A. be used as tracers in medical procedures  
B. damage DNA  
C. denature proteins  
D. emulsify fat  
E. create trans-fats in the bloodstream
Chapter 2 Key

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