Chapter 02

The Chemistry of Life

**True / False Questions**

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| 1. | Minerals are organic elements extracted from the soil by plants.    True    False |

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| 2. | Molecules composed of two or more atoms are called compounds.    True    False |

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| 3. | Hydrogen, deuterium, and tritium are three isotopes of hydrogen.    True    False |

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| 4. | Potassium, sodium, and chlorine are trace elements.     True    False |

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| 5. | Ionic bonds break apart in water more easily than covalent bonds do.     True    False |

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| 6. | A solution is a mixture of two or more substances that are physically blended but *not* chemically combined.    True    False |

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| 7. | The pH of blood plasma is approximately 7.4, which is slightly acidic.    True    False |

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| 8. | The high heat capacity of water makes it a very ineffective coolant.    True    False |

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| 9. | In an exchange reaction, covalent bonds are broken and new covalent bonds are formed.    True    False |

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| 10. | Chemical reactions in which larger molecules are broken down into smaller ones are called catabolic reactions.     True    False |

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| 11. | The opposite of a dehydration synthesis reaction is a hydrolysis reaction.    True    False |

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| 12. | Unsaturated fatty acids have as much hydrogen as they can carry.    True    False |

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| 13. | A dipeptide is a molecule with two peptide bonds.    True    False |

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| 14. | All amino acids have both a carboxyl group and an amino group attached to a central carbon.    True    False |

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| 15. | ATP is the body's most important form of long-term energy storage.     True    False |

**Multiple Choice Questions**

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| 16. | The most abundant element in the human body, by weight, is \_\_\_\_\_\_\_\_\_\_.      |  |  | | --- | --- | | A. | nitrogen |  |  |  | | --- | --- | | B. | hydrogen |  |  |  | | --- | --- | | C. | carbon |  |  |  | | --- | --- | | D. | oxygen |  |  |  | | --- | --- | | E. | calcium | |

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| 17. | Sodium has an atomic number of 11 and an atomic mass of 23. Sodium has \_\_\_\_\_\_\_\_\_\_.      |  |  | | --- | --- | | A. | 12 neutrons and 11 protons |  |  |  | | --- | --- | | B. | 12 protons and 11 neutrons |  |  |  | | --- | --- | | C. | 12 electrons and 11 neutrons |  |  |  | | --- | --- | | D. | 12 protons and 11 electrons |  |  |  | | --- | --- | | E. | 12 electrons and 11 protons | |

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| 18. | The chemical properties of an atom are determined by its \_\_\_\_\_\_\_\_\_\_.      |  |  | | --- | --- | | A. | protons |  |  |  | | --- | --- | | B. | electrons |  |  |  | | --- | --- | | C. | neutrons |  |  |  | | --- | --- | | D. | protons and neutrons |  |  |  | | --- | --- | | E. | particles | |

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| 19. | Na (atomic no. 11) reacts with Cl (atomic no. 17) to become stable. In the reaction, Na will \_\_\_\_\_\_\_\_\_\_\_\_, while Cl will \_\_\_\_\_\_\_\_\_\_\_\_.       |  |  | | --- | --- | | A. | accept one electron; give up one electron |  |  |  | | --- | --- | | B. | give up one proton; accept one proton |  |  |  | | --- | --- | | C. | share one electron with chlorine; share one electron with sodium |  |  |  | | --- | --- | | D. | become an anion; become a cation |  |  |  | | --- | --- | | E. | give up one electron; accept one electron | |

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| 20. | Oxygen has an atomic number of 8 and an atomic mass of 16. How many valence electrons does it have?       |  |  | | --- | --- | | A. | 2 |  |  |  | | --- | --- | | B. | 4 |  |  |  | | --- | --- | | C. | 6 |  |  |  | | --- | --- | | D. | 8 |  |  |  | | --- | --- | | E. | 16 | |

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| 21. | Oxygen has an atomic number of eight. When two oxygen atoms come together, they form a(n) \_\_\_\_\_\_\_\_\_\_ bond.      |  |  | | --- | --- | | A. | hydrogen |  |  |  | | --- | --- | | B. | nonpolar covalent |  |  |  | | --- | --- | | C. | polar covalent |  |  |  | | --- | --- | | D. | ionic |  |  |  | | --- | --- | | E. | Van der Waals | |

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| 22. | When table salt, sodium chloride (NaCl), is placed in water \_\_\_\_\_\_\_\_\_\_.      |  |  | | --- | --- | | A. | Na+ and Cl- form ionic bonds with each other |  |  |  | | --- | --- | | B. | Na+ and Cl- form polar covalent bonds with each other |  |  |  | | --- | --- | | C. | Na+ and Cl- form hydrogen bonds with water |  |  |  | | --- | --- | | D. | Ionic bonds between Na+ and Cl- are broken |  |  |  | | --- | --- | | E. | Na+ and Cl- become separated by their Van der Waals forces | |

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| 23. | The bonding properties of an atom are determined by its \_\_\_\_\_\_\_\_\_\_.      |  |  | | --- | --- | | A. | electrons |  |  |  | | --- | --- | | B. | protons |  |  |  | | --- | --- | | C. | positrons |  |  |  | | --- | --- | | D. | neutrons |  |  |  | | --- | --- | | E. | photons | |

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| 24. | What type of bond attracts one water molecule to another?       |  |  | | --- | --- | | A. | An ionic bond |  |  |  | | --- | --- | | B. | A peptide bond |  |  |  | | --- | --- | | C. | A hydrogen bond |  |  |  | | --- | --- | | D. | A covalent bond |  |  |  | | --- | --- | | E. | A hydrolytic bond | |

**Check All That Apply Questions**

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| 25. | Which of these is a cation? Check all that apply.     \_\_\_\_  O2 \_\_\_\_  K+ \_\_\_\_  Na+ \_\_\_\_  Ca2+ \_\_\_\_  Cl- |

**Multiple Choice Questions**

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| 26. | \_\_\_\_\_\_\_\_\_\_ account for 98.5% of the body's weight.      |  |  | | --- | --- | | A. | Carbon, oxygen, hydrogen, sodium, potassium, and chlorine |  |  |  | | --- | --- | | B. | Carbon, oxygen, iron, sodium, potassium, and chlorine |  |  |  | | --- | --- | | C. | Carbon, nitrogen, hydrogen, sodium, potassium, and chlorine |  |  |  | | --- | --- | | D. | Carbon, oxygen, hydrogen, nitrogen, sodium, and potassium |  |  |  | | --- | --- | | E. | Carbon, oxygen, hydrogen, nitrogen, calcium, and phosphorus | |

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| 27. | \_\_\_\_\_\_\_\_\_\_ differ from one another in their number of neutrons and atomic mass.      |  |  | | --- | --- | | A. | Cations |  |  |  | | --- | --- | | B. | Anions |  |  |  | | --- | --- | | C. | Isotopes |  |  |  | | --- | --- | | D. | Electrolytes |  |  |  | | --- | --- | | E. | Free radicals | |

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| 28. | When jumping into water you notice resistance. This resistance is caused by water's \_\_\_\_\_\_\_\_\_\_.       |  |  | | --- | --- | | A. | adhesiveness |  |  |  | | --- | --- | | B. | cohesiveness |  |  |  | | --- | --- | | C. | hydrophobic tension |  |  |  | | --- | --- | | D. | hydrophilic tension |  |  |  | | --- | --- | | E. | osmotic equilibrium | |

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| 29. | Which of these is hydrophobic?       |  |  | | --- | --- | | A. | Glucose |  |  |  | | --- | --- | | B. | K+ |  |  |  | | --- | --- | | C. | Cl- |  |  |  | | --- | --- | | D. | Water |  |  |  | | --- | --- | | E. | Fat | |

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| 30. | Blood contains NaCl, protein, and cells. The NaCl is in a(n) \_\_\_\_\_\_\_\_\_\_, the protein is in a(n) \_\_\_\_\_\_\_\_\_\_, and the cells are in a \_\_\_\_\_\_\_\_\_\_.      |  |  | | --- | --- | | A. | emulsion; solution; suspension |  |  |  | | --- | --- | | B. | solvent; emulsion; colloid |  |  |  | | --- | --- | | C. | colloid; suspension; solution |  |  |  | | --- | --- | | D. | suspension; colloid; solution |  |  |  | | --- | --- | | E. | solution; colloid; suspension | |

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| 31. | Which of these is the most appropriate to express the number of molecules per volume?      |  |  | | --- | --- | | A. | Molarity |  |  |  | | --- | --- | | B. | Volume |  |  |  | | --- | --- | | C. | Percentage |  |  |  | | --- | --- | | D. | Weight per volume |  |  |  | | --- | --- | | E. | Milliequivalents per liter | |

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| 32. | A solution with pH 4 has \_\_\_\_\_\_\_\_\_\_ the H+ concentration of a solution with pH 8.       |  |  | | --- | --- | | A. | ½ |  |  |  | | --- | --- | | B. | 2 times |  |  |  | | --- | --- | | C. | 4 times |  |  |  | | --- | --- | | D. | 10,000 times |  |  |  | | --- | --- | | E. | 1/10,000 | |

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| 33. | Which of these has the highest H+ concentration?       |  |  | | --- | --- | | A. | Lemon juice, pH = 2.3 |  |  |  | | --- | --- | | B. | Red wine, pH = 3.2 |  |  |  | | --- | --- | | C. | Tomato juice, pH = 4.7 |  |  |  | | --- | --- | | D. | Saliva, pH = 6.6 |  |  |  | | --- | --- | | E. | Household ammonia, pH = 10.8 | |

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| 34. | In a workout your muscle cells produce lactate, yet you maintain a constant blood pH because \_\_\_\_\_\_\_\_\_.      |  |  | | --- | --- | | A. | metabolic acids are neutralized in muscle cells before released into the blood |  |  |  | | --- | --- | | B. | metabolic bases are produced at the same rate by muscle cells to neutralize the acids |  |  |  | | --- | --- | | C. | the respiratory system removes excess H+ from the blood before the pH is lowered |  |  |  | | --- | --- | | D. | the body contains chemicals called buffers that resist changes in pH |  |  |  | | --- | --- | | E. | endothelial cells secrete excess H+ to prevent a decrease in pH | |

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| 35. | A solution that resists a change in pH when an acid or base is added to it is a(n) \_\_\_\_\_\_\_\_\_\_.       |  |  | | --- | --- | | A. | buffer |  |  |  | | --- | --- | | B. | catalyst |  |  |  | | --- | --- | | C. | reducing agent |  |  |  | | --- | --- | | D. | oxidizing agent |  |  |  | | --- | --- | | E. | colloid | |

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| 36. | A chemical reaction that removes electrons from an atom is called a(n) \_\_\_\_\_\_\_\_\_\_ reaction.      |  |  | | --- | --- | | A. | reduction |  |  |  | | --- | --- | | B. | condensation |  |  |  | | --- | --- | | C. | hydrolysis |  |  |  | | --- | --- | | D. | anabolic |  |  |  | | --- | --- | | E. | oxidation | |

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| 37. | The most relevant free energy in human physiology is the energy stored in \_\_\_\_\_\_\_\_\_\_.      |  |  | | --- | --- | | A. | electrolytes ionized in water |  |  |  | | --- | --- | | B. | free radicals with an odd number of electrons |  |  |  | | --- | --- | | C. | radioisotopes |  |  |  | | --- | --- | | D. | the chemical bonds of organic molecules |  |  |  | | --- | --- | | E. | Van der Waals forces | |

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| 38. | The breakdown of glycogen (an energy-storage compound) is an example of a(n) \_\_\_\_\_\_\_\_\_\_ reaction.      |  |  | | --- | --- | | A. | exergonic |  |  |  | | --- | --- | | B. | endergonic |  |  |  | | --- | --- | | C. | exchange |  |  |  | | --- | --- | | D. | synthesis |  |  |  | | --- | --- | | E. | equilibrium | |

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| 39. | Potential energy stored in bonds is released as \_\_\_\_\_\_\_\_\_\_ energy.      |  |  | | --- | --- | | A. | electromagnetic |  |  |  | | --- | --- | | B. | electrical |  |  |  | | --- | --- | | C. | chemical |  |  |  | | --- | --- | | D. | heat |  |  |  | | --- | --- | | E. | kinetic | |

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| 40. | The breakdown of glucose to yield carbon dioxide, oxygen, and ATP can be described as \_\_\_\_\_\_\_\_\_\_.       |  |  | | --- | --- | | A. | anabolic and endergonic |  |  |  | | --- | --- | | B. | catabolic and exergonic |  |  |  | | --- | --- | | C. | anabolic and exergonic |  |  |  | | --- | --- | | D. | catabolic and endergonic |  |  |  | | --- | --- | | E. | anabolic and exothermic | |

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| 41. | Which one of the following would *not* increase the rate of a reaction?       |  |  | | --- | --- | | A. | An increase in reactant concentrations |  |  |  | | --- | --- | | B. | A rise in temperature |  |  |  | | --- | --- | | C. | The presence of a catalyst |  |  |  | | --- | --- | | D. | The presence of an enzyme |  |  |  | | --- | --- | | E. | A decrease in reactant concentrations | |

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| 42. | Which of the following terms encompasses all of the other ones?       |  |  | | --- | --- | | A. | Catabolism |  |  |  | | --- | --- | | B. | Anabolism |  |  |  | | --- | --- | | C. | Metabolism |  |  |  | | --- | --- | | D. | Oxidation reactions |  |  |  | | --- | --- | | E. | Reduction reactions | |

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| 43. | The breakdown of starch by digestive enzymes into glucose molecules is a(n) \_\_\_\_\_\_\_\_\_\_ reaction.      |  |  | | --- | --- | | A. | synthesis |  |  |  | | --- | --- | | B. | decomposition |  |  |  | | --- | --- | | C. | exchange |  |  |  | | --- | --- | | D. | anabolic |  |  |  | | --- | --- | | E. | reduction | |

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| 44. | Which of the following equations depicts an exchange reaction?      |  |  | | --- | --- | | A. | AB → A + B |  |  |  | | --- | --- | | B. | A + B → AB |  |  |  | | --- | --- | | C. | AB + CD → AC + BD |  |  |  | | --- | --- | | D. | AB → A- + B+ |  |  |  | | --- | --- | | E. | A + B → AB → C + D | |

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| 45. | A(n) \_\_\_\_\_\_\_\_\_\_ is a group of atoms that determines many of the properties of an organic molecule.      |  |  | | --- | --- | | A. | carboxyl group |  |  |  | | --- | --- | | B. | functional group |  |  |  | | --- | --- | | C. | hydroxyl group |  |  |  | | --- | --- | | D. | amino group |  |  |  | | --- | --- | | E. | phosphate group | |

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| 46. | Which of the following is *not* an organic compound?      |  |  | | --- | --- | | A. | C16H18N3ClS |  |  |  | | --- | --- | | B. | Na2HPO3(H2O)5 |  |  |  | | --- | --- | | C. | CH4 |  |  |  | | --- | --- | | D. | C3H7O2N | |

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| 47. | A \_\_\_\_\_\_\_\_\_\_ reaction breaks a \_\_\_\_\_\_\_\_\_\_ down into its monomers.      |  |  | | --- | --- | | A. | hydrolysis; polymer |  |  |  | | --- | --- | | B. | dehydration synthesis; molecule |  |  |  | | --- | --- | | C. | dehydration synthesis; polymer |  |  |  | | --- | --- | | D. | polymer; molecule |  |  |  | | --- | --- | | E. | condensation; reactant | |

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| 48. | The formula of an amino group is \_\_\_\_\_\_\_\_\_\_; the formula of a carboxyl group is \_\_\_\_\_\_\_\_\_\_.      |  |  | | --- | --- | | A. | -COOH; -OH |  |  |  | | --- | --- | | B. | -CH3; -NH2 |  |  |  | | --- | --- | | C. | -OH; -SH |  |  |  | | --- | --- | | D. | -NH2; -COOH |  |  |  | | --- | --- | | E. | -SH; -H2PO4 | |

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| 49. | Table sugar is a disaccharide called \_\_\_\_\_\_\_\_\_\_ and is made up of the monomer(s) \_\_\_\_\_\_\_\_\_\_.      |  |  | | --- | --- | | A. | maltose; glucose and sucrose |  |  |  | | --- | --- | | B. | sucrose; glucose and fructose |  |  |  | | --- | --- | | C. | lactose; glucose and galactose |  |  |  | | --- | --- | | D. | glycogen; glucose and fructose |  |  |  | | --- | --- | | E. | glucose; galactose and fructose | |

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| 50. | Which of the following is a disaccharide?      |  |  | | --- | --- | | A. | Galactose |  |  |  | | --- | --- | | B. | Lactose |  |  |  | | --- | --- | | C. | Glucose |  |  |  | | --- | --- | | D. | Fructose |  |  |  | | --- | --- | | E. | Amylose | |

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| 51. | \_\_\_\_\_\_\_\_\_\_ is a monosaccharide, whereas \_\_\_\_\_\_\_\_\_\_ is a polysaccharide.      |  |  | | --- | --- | | A. | Fructose; sucrose |  |  |  | | --- | --- | | B. | Galactose; maltose |  |  |  | | --- | --- | | C. | Lactose; glycogen |  |  |  | | --- | --- | | D. | Glucose; starch |  |  |  | | --- | --- | | E. | Cellulose; glucose | |

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| 52. | In general, \_\_\_\_\_\_\_\_\_\_ have a 2:1 ratio of hydrogen to oxygen.      |  |  | | --- | --- | | A. | enzymes |  |  |  | | --- | --- | | B. | proteins |  |  |  | | --- | --- | | C. | lipids |  |  |  | | --- | --- | | D. | carbohydrates |  |  |  | | --- | --- | | E. | nucleic acids | |

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| 53. | Proteoglycans are composed of \_\_\_\_\_\_\_\_\_\_.      |  |  | | --- | --- | | A. | carbohydrates and fats |  |  |  | | --- | --- | | B. | nucleic acids and fats |  |  |  | | --- | --- | | C. | carbohydrates and proteins |  |  |  | | --- | --- | | D. | proteins and fats |  |  |  | | --- | --- | | E. | nucleic acids and proteins | |

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| 54. | Triglycerides consist of a 3-carbon compound called \_\_\_\_\_\_\_\_\_\_ bound to three \_\_\_\_\_\_\_\_\_\_.      |  |  | | --- | --- | | A. | pyruvate; fatty acids |  |  |  | | --- | --- | | B. | lactate; glycerols |  |  |  | | --- | --- | | C. | eicosanoid; steroids |  |  |  | | --- | --- | | D. | glycerol; fatty acids |  |  |  | | --- | --- | | E. | sterol; fatty acids | |

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| 55. | \_\_\_\_\_\_\_\_\_\_ are major components of cell membranes, and are said to be \_\_\_\_\_\_\_\_\_\_.      |  |  | | --- | --- | | A. | Triglycerides; hydrophobic |  |  |  | | --- | --- | | B. | Steroids; hydrophilic |  |  |  | | --- | --- | | C. | Bile acids; fat-soluble |  |  |  | | --- | --- | | D. | Eicosanoids; water-soluble |  |  |  | | --- | --- | | E. | Phospholipids; amphiphilic | |

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| 56. | Which of these molecules is hydrophobic?      |  |  | | --- | --- | | A. | Glucose |  |  |  | | --- | --- | | B. | Cholesterol |  |  |  | | --- | --- | | C. | Amino acid |  |  |  | | --- | --- | | D. | Protein |  |  |  | | --- | --- | | E. | Disaccharide | |

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| 57. | Proteins perform all of the following functions *except \_\_\_\_\_\_\_\_\_\_.*      |  |  | | --- | --- | | A. | catalyze metabolic reactions |  |  |  | | --- | --- | | B. | give structural strength to cells and tissues |  |  |  | | --- | --- | | C. | produce muscular and other forms of movement |  |  |  | | --- | --- | | D. | regulate transport of solutes into and out of cells |  |  |  | | --- | --- | | E. | store hereditary information | |

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| 58. | A drastic conformational change in a protein in response to extreme heat or pH is called \_\_\_\_\_\_\_\_\_\_.      |  |  | | --- | --- | | A. | contamination |  |  |  | | --- | --- | | B. | denaturation |  |  |  | | --- | --- | | C. | saturation |  |  |  | | --- | --- | | D. | sedimentation |  |  |  | | --- | --- | | E. | deconformation | |

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| 59. | Proteins are \_\_\_\_\_\_\_\_\_\_ built from \_\_\_\_\_\_\_\_\_\_ different amino acids.      |  |  | | --- | --- | | A. | monomers; 10 |  |  |  | | --- | --- | | B. | molecules; 10 |  |  |  | | --- | --- | | C. | polymers; 20 |  |  |  | | --- | --- | | D. | macromolecules; 40 |  |  |  | | --- | --- | | E. | peptides:25 | |

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| 60. | The folding and coiling of a protein into a globular shape is the \_\_\_\_\_\_\_\_\_\_ structure of the protein.      |  |  | | --- | --- | | A. | primary |  |  |  | | --- | --- | | B. | secondary |  |  |  | | --- | --- | | C. | tertiary |  |  |  | | --- | --- | | D. | quaternary |  |  |  | | --- | --- | | E. | denatured | |

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| 61. | An enzyme is substrate-specific because of the shape of its \_\_\_\_\_\_\_\_\_\_.      |  |  | | --- | --- | | A. | active site |  |  |  | | --- | --- | | B. | receptor |  |  |  | | --- | --- | | C. | secondary structure |  |  |  | | --- | --- | | D. | terminal amino acid |  |  |  | | --- | --- | | E. | alpha chain | |

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| 62. | \_\_\_\_\_\_\_\_\_\_ is the substrate of \_\_\_\_\_\_\_\_\_\_.      |  |  | | --- | --- | | A. | Glucose; lactose |  |  |  | | --- | --- | | B. | Lactase; glucose |  |  |  | | --- | --- | | C. | Lactose; lactase |  |  |  | | --- | --- | | D. | Galactose; lactose |  |  |  | | --- | --- | | E. | Sucrase; sucrose | |

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| 63. | All enzymes are \_\_\_\_\_\_\_\_\_\_.      |  |  | | --- | --- | | A. | cofactors |  |  |  | | --- | --- | | B. | proteins |  |  |  | | --- | --- | | C. | lipids |  |  |  | | --- | --- | | D. | carbohydrates |  |  |  | | --- | --- | | E. | nucleic acids | |

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| 64. | Nucleic acids are \_\_\_\_\_\_\_\_\_\_ of \_\_\_\_\_\_\_\_\_\_.      |  |  | | --- | --- | | A. | monomers; monosaccharides |  |  |  | | --- | --- | | B. | monomers; ATP |  |  |  | | --- | --- | | C. | polymers; nucleotides |  |  |  | | --- | --- | | D. | polymers; cAMP |  |  |  | | --- | --- | | E. | polymers; DNA | |

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| 65. | ATP\_\_\_\_\_\_\_\_\_\_ endergonic and exergonic reactions.      |  |  | | --- | --- | | A. | opposes |  |  |  | | --- | --- | | B. | decomposes |  |  |  | | --- | --- | | C. | reduces |  |  |  | | --- | --- | | D. | links |  |  |  | | --- | --- | | E. | dehydrates | |

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| 66. | Minerals are found in all of the following *except* \_\_\_\_\_\_\_\_\_\_.      |  |  | | --- | --- | | A. | bones and teeth |  |  |  | | --- | --- | | B. | vitamins |  |  |  | | --- | --- | | C. | thyroid hormone |  |  |  | | --- | --- | | D. | electrolytes | |

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| 67. | An atom with 12 electrons, 13 neutrons, and 11 protons is a(n) \_\_\_\_\_\_\_\_\_\_.      |  |  | | --- | --- | | A. | anion |  |  |  | | --- | --- | | B. | cation |  |  |  | | --- | --- | | C. | free radical |  |  |  | | --- | --- | | D. | isotope |  |  |  | | --- | --- | | E. | both an anion and an isotope |  |  |  | | --- | --- | | F. | both an anion and a free radical | |

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| 68. | The concentration of a solution may be expressed by all of the following *except* \_\_\_\_\_\_\_\_\_.       |  |  | | --- | --- | | A. | weight per volume |  |  |  | | --- | --- | | B. | percentage |  |  |  | | --- | --- | | C. | molarity |  |  |  | | --- | --- | | D. | pH | |

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| 69. | The vibration of an ear drum is an example of \_\_\_\_\_\_\_\_\_\_ energy.       |  |  | | --- | --- | | A. | kinetic |  |  |  | | --- | --- | | B. | potential |  |  |  | | --- | --- | | C. | elastic |  |  |  | | --- | --- | | D. | radiant | |

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| 70. | In the following reaction, what is(are) the product(s)?  CO2 + H2O ---> H2CO3       |  |  | | --- | --- | | A. | H2CO3 |  |  |  | | --- | --- | | B. | CO2 and H2O |  |  |  | | --- | --- | | C. | CO2 and H2CO3 |  |  |  | | --- | --- | | D. | H2O and H2CO3 | |

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| 71. | Which of the following will increase the rate of a chemical reaction?       |  |  | | --- | --- | | A. | An increase in reactant concentration |  |  |  | | --- | --- | | B. | An increase in product concentration |  |  |  | | --- | --- | | C. | A decreased temperature |  |  |  | | --- | --- | | D. | Enzyme inhibition | |

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| 72. | Carbon is very versatile in forming bonds with other atoms because it has \_\_\_\_\_\_\_\_\_\_ valence electrons.       |  |  | | --- | --- | | A. | four |  |  |  | | --- | --- | | B. | two |  |  |  | | --- | --- | | C. | eight |  |  |  | | --- | --- | | D. | six | |

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| 73. | Amylase is a digestive enzyme that breaks starches down into sugars through \_\_\_\_\_\_\_\_\_\_ reactions.      |  |  | | --- | --- | | A. | hydrolysis |  |  |  | | --- | --- | | B. | dehydration synthesis |  |  |  | | --- | --- | | C. | anabolic |  |  |  | | --- | --- | | D. | endergonic | |

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| 74. | Which of the following is ***not*** a nucleotide?      |  |  | | --- | --- | | A. | RNA |  |  |  | | --- | --- | | B. | GTP |  |  |  | | --- | --- | | C. | ATP |  |  |  | | --- | --- | | D. | cAMP | |

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| 75. | Metabolism is the sum of \_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_.      |  |  | | --- | --- | | A. | inhalation; exhalation |  |  |  | | --- | --- | | B. | growth; differentiation |  |  |  | | --- | --- | | C. | anabolism; catabolism |  |  |  | | --- | --- | | D. | positive; negative feedback |  |  |  | | --- | --- | | E. | responsiveness; movement | |

**True / False Questions**

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| --- | --- |
| 76. | A molecule that is oxidized gains electrons and energy.     True    False |