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SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

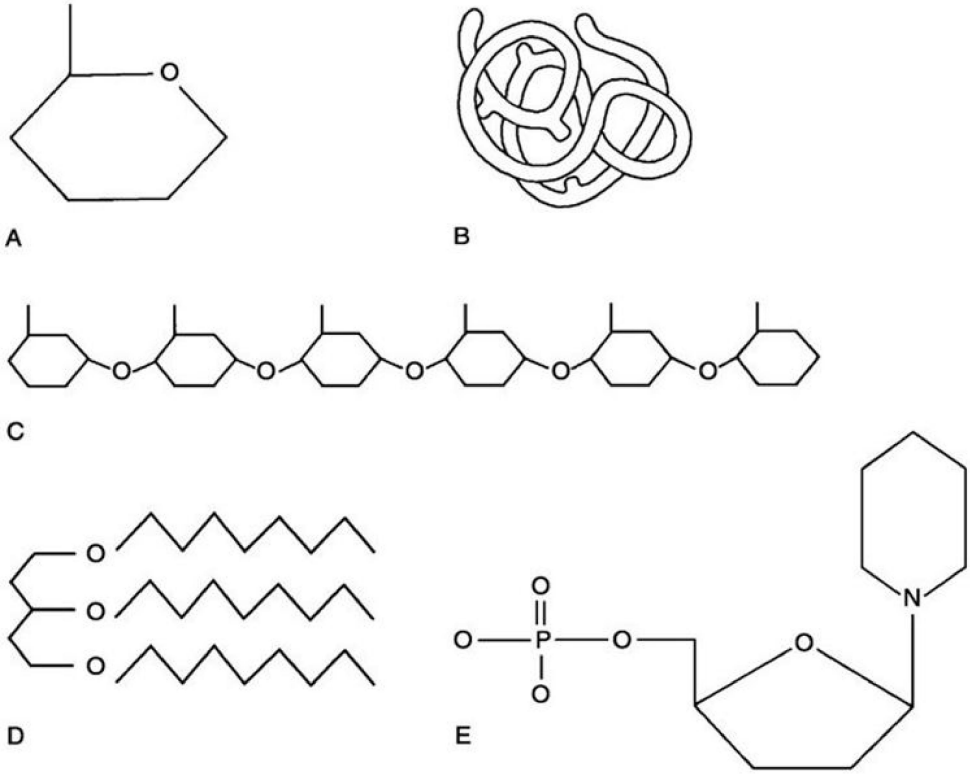

Figure 2.1

Using Figure 2.1, match the following:

1) Lipid.
   Answer: D

2) Functional protein.
   Answer: B

3) Nucleotide.
   Answer: E

4) Polysaccharide.
   Answer: C

5) Monosaccharide.
   Answer: A

6) Polymer.
   Answer: C

7) Tertiary (protein) structure.
   Answer: B

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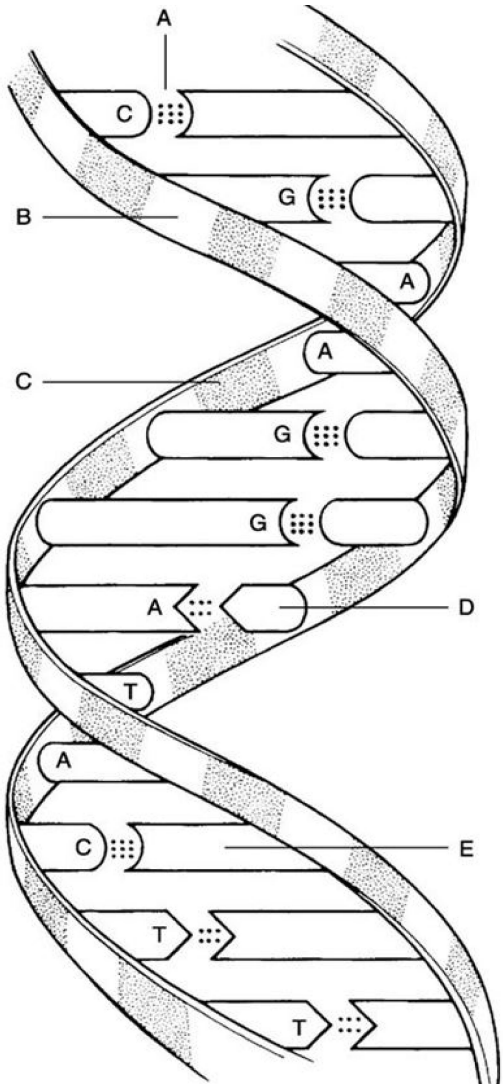

Figure 2.2

Using Figure 2.2, match the following:

8) Deoxyribose sugar.
   Answer: B

9) Thymine.
   Answer: D

10) Guanine.
    Answer: E

11) Phosphate.
    Answer: C

12) Hydrogen bonds.
    Answer: A

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MATCHING. Choose the item in column 2 that best matches each item in column 1.

Match the following chemical bonds to the correct description:

13) A bond in which electrons are shared unequally.
Answer: A

14) A bond in which electrons are completely lost or gained by the atoms involved.
Answer: D

15) A bond in which electrons are shared equally.
Answer: C

16) A type of bond important in tying different parts of the same molecule together into a three–dimensional structure.
Answer: B

A) Polar covalent bond

B) Hydrogen bond

C) Nonpolar covalent bond

D) Ionic bond

Match the following particles to the correct description:

17) Electrically charged particle due to loss of an electron.
Answer: B

18) Neutral subatomic particle.
Answer: A

19) Smallest particle of an element that retains its properties.
Answer: D

20) Combination of two or more atoms of the same element held together by chemical bonds.
Answer: C

A) Neutron

B) Cation

C) Molecule

D) Atom

Match the following:

21) Water.
Answer: A

A) Compound

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22) Carbon.
Answer: C

23) Dry ice (frozen carbon dioxide).
Answer: A

24) Blood.
Answer: B

A) Compound

B) Mixture

C) Element

Match the following:

25) Can be measured only by its effects on matter.
Answer: C

26) Anything that occupies space and has mass.
Answer: B

27) Although a man who weighs 175 pounds on Earth would be lighter on the moon and heavier on Jupiter, his _____ would not be different.
Answer: A

28) Is a function of, and varies with, gravity.
Answer: D

A) Mass

B) Matter

C) Energy

D) Weight

Match the following:

29) Legs moving the pedals of a bicycle.
Answer: B

30) When the bonds of ATP are broken, energy is released to do cellular work.
Answer: A

A) Chemical energy

B) Mechanical energy

Match the following:

31) Energy that travels in waves. Part of the electromagnetic spectrum.
Answer: A

32) Represented by the flow of charged particles along a conductor, or the flow of ions across a membrane.
Answer: B

A) Radiant energy

B) Electrical energy

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Match the following:

33) Heterogeneous, will not settle.
Answer: C

34) Heterogeneous, will settle.
Answer: B

35) Homogeneous, will not settle.
Answer: A

36) Will not scatter light.
Answer: A

A) Solutions

B) Suspensions

C) Colloids

Match the following:

37) Usually, the first one or two letters of an element's name.
Answer: A

38) Number of protons in an atom.
Answer: B

39) Combined number of protons and neutrons in an atom.
Answer: C

A) Atomic symbol

B) Atomic number

C) Mass number of an element

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

40) The atomic weight is an average of the relative weights (mass numbers) of all the isotopes of an element.
A) True
B) False
Answer: A

41) It is the difference in the R group that makes each amino acid chemically unique.
A) True
B) False
Answer: A

42) Chemical properties are determined primarily by neutrons.
A) True
B) False
Answer: B

43) A charged particle is generally called an ion or electrolyte.
A) True
B) False
Answer: A

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44) Isotopes differ from each other only in the number of electrons the atom contains.
A) True
B) False
Answer: B

45) About 60% to 80% of the volume of most living cells consists of organic compounds.
A) True
B) False
Answer: B

46) Triglycerides are a poor source of stored energy.
A) True
B) False
Answer: B

47) Omega–3 fatty acids appear to decrease the risk of heart disease.
A) True
B) False
Answer: A

48) Glucose is an example of a monosaccharide.
A) True
B) False
Answer: A

49) Glycogen, the storage form of glucose, is primarily stored in skeletal muscle and liver cells.
A) True
B) False
Answer: A

50) The lower the pH, the higher the hydrogen ion concentration.
A) True
B) False
Answer: A

51) Covalent bonds are generally less stable than ionic bonds.
A) True
B) False
Answer: B

52) Hydrogen bonds are too weak to bind atoms together to form molecules, but they do hold different parts of a single large molecule in a specific three–dimensional shape.
A) True
B) False
Answer: A

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53) The fact that no chemical bonding occurs between the components of a mixture is the chief difference between mixtures and compounds.
A) True
B) False
Answer: A

54) The acidity of a solution reflects the concentration of free hydrogen ions in the solution.
A) True
B) False
Answer: A

55) A chemical bond is an energy relationship between outer electrons and neighboring atoms.
A) True
B) False
Answer: A

56) All organic compounds contain carbon.
A) True
B) False
Answer: A

57) A dipeptide can be broken into two amino acids by dehydration synthesis.
A) True
B) False
Answer: B

58) The pH of body fluids must remain fairly constant for the body to maintain homeostasis.
A) True
B) False
Answer: A

59) Mixtures are combinations of elements or compounds that are physically blended together but are not bound by chemical bonds.
A) True
B) False
Answer: A

60) Buffers resist abrupt and large changes in the pH of body fluids by releasing or binding ions.
A) True
B) False
Answer: A

61) Which of the following elements is necessary for proper conduction of nerve impulses?
A) P
B) Fe
C) I
D) Na
Answer: D

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62) The basic structural material of the body consists of _____.
A) nucleic acids
B) proteins
C) carbohydrates
D) lipids

Answer: B

63) In general, the lipids that we refer to as oils have _____.
A) long fatty acid chains
B) unsaturated fatty acids
C) a high water content
D) saturated fatty acids

Answer: B

64) The genetic information is coded in DNA by the _____.
A) sequence of the nucleotides
B) regular alteration of sugar and phosphate molecules
C) three–dimensional structure of the double helix
D) arrangement of the histones

Answer: A

65) Which of the following does *not* characterize proteins?
A) They appear to be the molecular carriers of coded hereditary information.
B) They may be denatured or coagulated by heat or acidity.
C) Their function depends on their three–dimensional shape.
D) They have both functional and structural roles in the body.

Answer: A

66) The single most abundant protein in the body is _____.
A) DNA
B) hemoglobin
C) glucose
D) collagen

Answer: D

67) Carbohydrates are stored in the liver and skeletal muscles in the form of _____.
A) glucose
B) glycogen
C) triglycerides
D) cholesterol

Answer: B

68) Which of the following does *not* describe enzymes?
A) Enzymes work by raising the energy of activation.
B) Some enzymes are protein plus a cofactor.
C) Some enzymes are purely protein.
D) Each enzyme is chemically specific.

Answer: A

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69) Which of the following is a general function for a fibrous protein?
A) protein management
B) structural framework
C) transport
D) catalysis
E) body defense

Answer: B

70) A chemical reaction in which bonds are broken is usually associated with _____.
A) forming a larger molecule
B) the consumption of energy
C) the release of energy
D) a synthesis

Answer: C

71) Salts are always _____.
A) hydrogen bonded
B) double covalent compounds
C) single covalent compounds
D) ionic compounds

Answer: D

72) The numbers listed represent the number of electrons in the first, second, and third energy levels, respectively. On this basis, which of the following is an unstable or reactive atom?
A) 2, 8, 1
B) 2, 8
C) 2, 8, 8
D) 2

Answer: A

73) Which of the following statements is *false*?
A) The more hydrogen ions in a solution, the more acidic the solution.
B) When the hydrogen ion concentration decreases, the hydroxyl ion concentration also decreases.
C) When acids and bases are mixed, they react with each other to form water and a salt.
D) The pH of blood is slightly basic.

Answer: B

74) Which of the following is the major positive ion outside cells?
A) sodium
B) magnesium
C) potassium
D) hydrogen

Answer: A

75) Which of the following would be regarded as an organic molecule?
A) NaOH
B) NaCl
C) H_2O
D) CH_4

Answer: D

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76) What is a chain of more than 50 amino acids called?
A) nucleic acid
B) polysaccharide
C) protein
D) triglyceride

Answer: C

77) What structural level is represented by the coiling of the protein chain backbone into an alpha helix?
A) secondary structure
B) quaternary structure
C) tertiary structure
D) primary structure

Answer: A

78) Carbohydrates and proteins are built up from their basic building blocks by the _____.
A) removal of a water molecule between each two units
B) addition of a carbon atom between each two units
C) removal of a carbon atom between each two units
D) addition of a water molecule between each two units

Answer: A

79) Which statement about enzymes is *false*?
A) Most enzymes can catalyze millions of reactions per minute.
B) Enzymes require contact with substrate in order to assume their active form.
C) Enzymes may use coenzymes derived from vitamins or cofactors from metallic elements.
D) Enzymes may be damaged by high temperature.

Answer: B

80) Which of the following statements is *false*?
A) Catalysts increase the rate of chemical reactions, sometimes while undergoing reversible changes in shape.
B) Chemical reactions progress at a faster rate when the reacting particles are present in higher numbers.
C) Chemical reactions proceed more quickly at higher temperatures.
D) Larger particles move faster than smaller ones and thus collide more frequently and more forcefully.

Answer: D

81) Choose the answer that best describes HCO_3^-.
A) a proton donor
B) a bicarbonate ion
C) a weak acid
D) common in the liver

Answer: B

82) Select which reactions will usually be irreversible regarding chemical equilibrium in human bodies.
A) ADP + Pi to make ATP
B) glucose to CO_2 and H_2O
C) glucose molecules joined to make glycogen
D) H_2O + CO_2 to make H_2CO_3

Answer: B

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83) What happens in redox reactions?
A) both decomposition and electron exchange occur
B) the organic substance that loses hydrogen is usually reduced
C) the reaction is uniformly reversible
D) the electron acceptor is oxidized

Answer: A

84) Choose the answer that best describes fibrous proteins.
A) are cellular catalysts
B) rarely exhibit secondary structure
C) are usually called enzymes
D) are very stable and insoluble in water

Answer: D

85) Which of the following does *not* describe uses for the ATP molecule?
A) chemical work
B) transport across membranes
C) pigment structure
D) mechanical work

Answer: C

86) Select the most correct statement regarding nucleic acids.
A) RNA is a long, single–stranded molecule made up of the bases A, T, G, and C.
B) DNA is a long, double–stranded molecule made up of A, T, G, and C bases.
C) Three forms exist: DNA, RNA, and tDNA.
D) tDNA is considered a "molecular slave" of DNA during protein synthesis.

Answer: B

87) Which of the following is an example of a suspension?
A) rubbing alcohol
B) cytosol
C) salt water
D) blood

Answer: D

88) Select the correct statement about isotopes.
A) Isotopes occur only in the heavier elements.
B) Isotopes of the same element have the same atomic number but differ in their mass number.
C) All the isotopes of an element are radioactive.
D) All the isotopes of an element have the same number of neutrons but differing numbers of electrons.

Answer: B

89) The four elements that make up about 96% of body weight are _____.
A) nitrogen, hydrogen, calcium, sodium
B) sodium, potassium, hydrogen, oxygen
C) carbon, oxygen, hydrogen, nitrogen
D) carbon, oxygen, phosphorus, calcium

Answer: C

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90) _____ is fat soluble, produced in the skin on exposure to UV radiation, and necessary for normal bone growth and function.
A) Vitamin D
B) Vitamin A
C) Vitamin K
D) Cortisol

Answer: A

91) You notice that you cannot read your book through a test tube of patient fluid held against the print, making it so blurred as to be unreadable. There is no precipitant in the bottom of the beaker, though it has been sitting for several days in a rack. What type of liquid is this?
A) suspension
B) colloid
C) solution
D) mixture

Answer: B

92) Atom X has 17 protons. How many electrons are in its valence shell (outermost energy level)?
A) 7
B) 3
C) 5
D) 10

Answer: A

93) A high fever causes an enzyme to lose its three dimensional structure and function. Which bonds are broken when a protein denatures?
A) polar covalent bonds
B) non–polar covalent bonds
C) hydrogen bonds
D) ionic bonds

Answer: C

94) If atom X has an atomic number of 74 it would have which of the following?
A) 74 protons
B) 37 electrons
C) 37 protons and 37 electrons
D) 37 protons and 37 neutrons

Answer: A

95) What does the formula $C_6H_{12}O_6$ mean?
A) There are, 6 carbon, 12 hydrogen, and 6 oxygen atoms.
B) The molecular weight is 24.
C) The substance is a colloid.
D) There are 6 calcium, 12 hydrogen, and 6 oxygen atoms.

Answer: A

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96) An atom with 3 electrons in its outermost (valence) shell may have a total of _____ electrons altogether.
A) 17
B) 3
C) 13
D) 8

Answer: C

97) Which of the following is a neutralization reaction?
A) $HCl \rightarrow H^+ + Cl^-$
B) $NH_3 + H^+ \rightarrow NH_4^{+2}$
C) $NaOH \rightarrow Na^+ + OH^-$
D) $HCl + NaOH \rightarrow NaCl + H_2O$

Answer: D

98) The chemical symbol O=O means _____.
A) the atoms are double bonded
B) zero equals zero
C) this is an ionic bond with two shared electrons
D) both atoms are bonded and have zero electrons in the outer orbit

Answer: A

99) What is a dipole?
A) an organic molecule
B) a type of reaction
C) a polar molecule
D) a type of bond

Answer: C

100) What does CH_4 mean?
A) There are four carbon and four hydrogen atoms.
B) This was involved in a redox reaction.
C) There is one carbon and four hydrogen atoms.
D) This is an inorganic molecule.

Answer: C

101) Amino acids joining together to make a peptide is a good example of a(n) _____ reaction.
A) reversible
B) synthesis
C) decomposition
D) exchange

Answer: B

102) Which of the following is *not* considered a factor in influencing a reaction rate?
A) temperature
B) concentration of reactants
C) time
D) particle size

Answer: C

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103) Which property of water is demonstrated when we sweat?
A) high heat capacity
B) high heat of vaporization
C) reactivity
D) cushioning
E) polar solvent properties

Answer: B

104) Sucrose is a _____.
A) disaccharide
B) monosaccharide
C) triglyceride
D) polysaccharide

Answer: A

105) What is the ratio of fatty acids to glycerol in triglycerides (neutral fats)?
A) 2:1
B) 3:1
C) 1:1
D) 4:1

Answer: B

106) In a DNA molecule, the phosphate serves _____.
A) to hold the molecular backbone together
B) as a code
C) to bind the sugars to their bases
D) as nucleotides

Answer: A

107) When frying an egg, the protein albumin denatures and maintains only its _____ structure.
A) secondary
B) quaternary
C) primary
D) tertiary

Answer: C

108) Which of the following is chemically inert (unreactive)?
A) oxygen (atomic number 8)
B) neon (atomic number 10)
C) carbon (atomic number 6)
D) sodium (atomic number 11)

Answer: B

109) An atom with an atomic number of 10 and a mass number of 24 would have _____.
A) 14 electrons
B) 14 neutrons
C) 24 protons
D) 10 neutrons

Answer: B

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110) When DNA is replicated, it is necessary for the two strands to "unzip" temporarily. Choose which bonding type is most appropriate for holding the strands together in this way.
A) polar covalent bonding
B) non–polar covalent bonding
C) ionic bonding
D) hydrogen bonding

Answer: D

111) Lithium has an atomic number of 3. How many electrons are there in the outermost (valence) shell?
A) one
B) two
C) zero
D) three

Answer: A

112) ATP → ADP + Pi is an example of a(n) _____ reaction.
A) exchange
B) reversible
C) synthesis
D) decomposition

Answer: D

113) An acid with a pH of 6 has _____ hydrogen ions than pure water.
A) 10–fold fewer
B) 100–fold more
C) 10–fold more
D) 100–fold fewer

Answer: C

114) A patient is hyperventilating. The "blowing off" of excessive carbon dioxide causes a decrease in blood H^+ concentration. How can the carbonic acid–bicarbonate buffer system function to correct this imbalance?

$CO_2 + H_2O \leftrightarrow H_2CO_3 \leftrightarrow H^+ + HCO_3^-$

A) H_2CO_3 dissociates to form more H^+ and raise pH
B) HCO_3^- binds with H^+ to form H_2CO_3 and lower pH
C) HCO_3^- binds with H^+ to form H_2CO_3 and raise pH
D) H_2CO_3 dissociates to form more H^+ and lower pH

Answer: D

115) Forming glycogen as energy storage in the liver is an example of _____.
A) exergonic
B) oxidation
C) anabolism
D) catabolism

Answer: C

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116) Salivary amylase is an enzyme produced by the salivary glands that breaks down carbohydrates. What will happen to this enzyme as it follows the food into the stomach where the pH drops to 2.5?
A) The enzyme will continue to function as it remains unchanged in chemical reactions.
B) The enzyme will assume an alternate form and catalyze additional reactions.
C) The enzyme will denature and become inactive.
D) The enzyme will denature but retain its function.

Answer: C

117) With a family history of cardiovascular disease, which toast spread would be considered the most "heart healthy?"
A) margarine containing trans fats
B) lard (pig fat)
C) butter containing butterfat
D) olive oil

Answer: D

118) Which of the following is incorrectly matched?
A) eicosanoid; triglyceride
B) amino acid; protein
C) nucleotide; nucleic acid
D) monosaccharide; carbohydrate

Answer: A

119) Starch is the stored carbohydrate in plants, while _____ is the stored carbohydrate in animals.
A) glycogen
B) glucose
C) triglyceride
D) cellulose

Answer: A

120) How many phosphates would AMP have attached to it?
A) one
B) three
C) none
D) two

Answer: A

121) Tendons are strong, rope–like structures that connect skeletal muscle to bone. Which of the following proteins would provide strength to a tendon?
A) collagen
B) albumin
C) actin
D) molecular chaperone

Answer: A

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122) Phospholipids make up most of the lipid part of the cell membrane. Since water exists on both the outside and inside of a cell, which of the following phospholipid arrangements makes the most sense?
A) a single layer of phospholipids with the polar heads facing inside the cell
B) a single layer of phospholipids with the polar heads facing outside the cell
C) two back–to–back phospholipid layers with the non–polar tails facing out on both sides
D) two back–to–back phospholipid layers with the polar heads facing out on both sides

Answer: D

123) What type of chemical bond can form between an atom with 11 protons and an atom with 17 protons?
A) polar covalent
B) non–polar covalent
C) hydrogen
D) ionic

Answer: D

ESSAY. Write your answer in the space provided or on a separate sheet of paper.

124) What happens when globular proteins are denatured?

Answer: The active sites are destroyed.

125) Explain the difference between potential and kinetic energy.

Answer: Potential energy is inactive stored energy that has potential to do work. Kinetic energy is energy in action.

126) How can phospholipids form a film when mixed in water?

Answer: Phospholipids have both polar and nonpolar ends. The polar end interacts with water, leaving the nonpolar end oriented in the opposite direction.

127) What properties does water have that make it a very versatile fluid?

Answer: High heat capacity, high heat of vaporization, polar solvent properties, reactivity, and cushioning.

128) What advantages does ATP have in being the energy currency molecule?

Answer: Its energy is easy to capture and store; it releases just the right amount of energy for the cell's needs so it is protected from excessive energy release. A universal energy currency is efficient because a single system can be used by all the cells in the body.

129) Explain why chemical reactions in the body are often irreversible.

Answer: Chemical reactions that release energy cannot be reversed unless energy is put back into the system. Also, some reactions produce molecules in excessive quantities (like CO_2 and NH_4) that the body then eliminates, but which are needed to reverse a reaction.

130) When a set of electrodes connected to a light bulb is placed in a solution of dextrose and a current is applied, the light bulb does not light up. When the same unit is placed in HCl, it does. Why?

Answer: HCl ionizes to form current–conducting electrolytes. Dextrose does not ionize, and therefore does not conduct current.

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131) Describe the factors that affect chemical reaction rates.

Answer: Temperature increases kinetic energy and therefore the force of molecular collisions. Particle size: smaller particles move faster at the same temperature and therefore collide more frequently; also, smaller particles have more surface area given the same concentration of reactants. Concentration: the higher the concentration, the greater the chance of particles colliding. Catalysts increase the rate of the reaction at a given temperature. Enzymes are biological catalysts.

132) Protons and electrons exist in every atom nucleus except hydrogen. Is this statement true or false and why?

Answer: False. Hydrogen has one proton and one electron. It is the neutron, not the electron that can coexist in the nucleus and that hydrogen does not have.

133) A chemical bond never occurs between components of a mixture. Discuss this.

Answer: Mixtures come in three forms — solutions, colloids, and suspensions. Components of these mixtures always retain their original makeup and can be separated into their individual components; therefore no chemical bonding has taken place.

134) All chemical reactions are theoretically reversible. Comment on this statement.

Answer: It is possible to reverse any reaction if the products are still present. Those that are only slightly exergonic are easily reversible. Some would require an enormous amount of energy to reverse. In the simple reaction Na + Cl → NaCl the amount of energy it takes to reverse table salt to chlorine gas and sodium metal is enormous. When glucose is oxidized the energy goes into bonds of ATP molecules which are then spent and thus the energy is not available to reform glucose.

135) What is the major difference between polar and nonpolar covalent bonds?

Answer: Polar bonds have an unequal sharing of electrons resulting in a slight negative charge at one end of the molecule and a slight positive charge at the other end. Nonpolar bonds have an equal sharing of electrons, resulting in a balanced charge among the atoms.

136) An amino acid may act as a proton acceptor or donor. Explain.

Answer: Amino acids have two components — a base group (proton acceptor) and an organic acid part (a proton donor). Some have additional base or acid groups on the ends of their R groups as well.

137) Name at least four things you know about enzymes.

Answer:
1. Most are proteins.
2. They have specific binding sites for specific substrates.
3. They lower the activation barrier for a specific reaction.
4. The names often end in "ase."
5. They can be denatured.
6. They can be used again and again.

138) In the compound H_2CO_3, what do the numbers 2 and 3 represent?

Answer: The 2 indicates that there are two hydrogen atoms in the compound and the 3 indicates that there are three oxygen atoms in the compound.

139) Are all chemical reactions reversible? If not, why aren't they all reversible?

Answer: All chemical reactions are theoretically reversible, but only if the products are not consumed and enough energy is available for the reaction.

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140) If all protons, electrons, and neutrons are alike, regardless of the atom considered, what determines the unique properties of each element?

Answer: Atoms of different elements are composed of different numbers of protons, electrons, and neutrons.

141) Mrs. Mulligan goes to her dentist and, after having a couple of cavities filled, her dentist strongly suggests that she reduce her intake of sodas and increase her intake of calcium phosphates in the foods she eats. Why?

Answer: Sodas are strong acids that can reduce bone and tooth salts. Calcium phosphate makes teeth hard and therefore more resistant to tooth decay.

142) Although his cholesterol levels were not high, Mr. Martinez read that cholesterol was bad for his health, so he eliminated all foods and food products containing this molecule. He later found that his cholesterol level dropped only 20%. Why did it not drop more?

Answer: Cholesterol is produced by the liver, in addition to being ingested in foods.

143) How can DNA be used to "fingerprint" a suspect in a crime?

Answer: The DNA of a person is unique to that individual. By obtaining the DNA from nucleated cells from the crime scene (e.g., blood, semen, other body tissues), enzymes may be used to break up the DNA into fragments. Because nearly everyone's DNA is different, it also breaks up into fragments differently. When the fragments are separated, they form patterns even more unique than fingerprint patterns. A match of suspect and crime scene DNA is strong evidence.

144) Why is it possible for us to drink a solution that contains a mixture of equal concentration of a strong acid and a strong base, either of which, separately, would be very caustic?

Answer: When an acid and base of equal strength are mixed, they undergo a displacement (neutralization) reaction to form water and a salt.

145) A 65–year–old patient came to the emergency room with complaints of severe heartburn unrelieved by taking a "large handful" of antacids. Would you expect the pH to be high or low? Explain why.

Answer: You would expect a high pH. Taking antacids will neutralize the acidic stomach. Taking a "handful" of antacids can cause an alkaloid state. Certain drugs, such as corticosteroids and antacids that contain baking soda, will lead to metabolic alkalosis.

146) A 23–year–old male was riding his road bike in 100–degree heat, when he suddenly became nauseated and weak. He called 911 from his cell phone. When the ambulance came, the paramedics started intravenous therapy for severe dehydration. Explain the critical role of water to maintain homeostasis.

Answer: Water is the most abundant and important inorganic compound in living material. It makes up 60% to 80% of the volume of most living cells. The properties of water are: high heat capacity, high heat of vaporization, polar solvent properties, reactivity, and cushioning. In this case the bicyclist lost a large amount of water through perspiration in an effort to cool his body. This caused a disruption in homeostasis.

147) Brenda is a 26–year–old female who is being discharged from the hospital after a vaginal delivery of an 8–pound healthy infant. Brenda is instructed by the nurse to eat a diet high in fiber and to drink 8 glasses of water per day to prevent constipation. Explain the role of fiber and water to promote defecation.

Answer: Cellulose is a polysaccharide found in all plant products that adds bulk to the diet to promote feces through the colon. Water acts as a lubricating liquid within the colon, which eases feces through the bowel.

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