

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

- 1) Nonpolar organic molecules are good examples of 1) _____
A) solutes.
B) molecules that will dissociate when placed into water.
C) hydrophilic compounds.
D) hydrophobic compounds.
E) electrolytes.

Answer: D

- Explanation: A)
B)
C)
D)
E)

- 2) The hydrolysis of ATP yields ADP, phosphate ion, and 2) _____
A) energy.
B) adenine.
C) a hydrogen ion.
D) ribose sugar.
E) a second phosphate ion.

Answer: A

- Explanation: A)
B)
C)
D)
E)

- 3) The mass number represents the number of 3) _____
A) electrons in an ion.
B) protons in an atom.
C) neutrons in an atom.
D) protons + neutrons.
E) neutrons + electrons.

Answer: D

- Explanation: A)
B)
C)
D)
E)

4) The molecule DNA contains a five-carbon sugar called

4) _____

- A) deoxyribose.
- B) oxyribose.
- C) glucose.
- D) ribose.
- E) adenine.

Answer: A

- Explanation:
- A)
 - B)
 - C)
 - D)
 - E)

5) Ions with a negative charge are called

5) _____

- A) anions.
- B) cations.
- C) positrons.
- D) polar molecules.
- E) protons.

Answer: A

- Explanation:
- A)
 - B)
 - C)
 - D)
 - E)

6) Elements that have atoms with full outer shells of electrons

6) _____

- A) will normally form cations.
- B) will form many compounds.
- C) are inert gases.
- D) will normally form anions.
- E) frequently form hydrogen bonds.

Answer: C

- Explanation:
- A)
 - B)
 - C)
 - D)
 - E)

7) _____ are molecules with two fatty acid chains and a phosphate group that form biological membranes.

7) _____

- A) Phospholipids
- B) Eicosanoids
- C) Glycolipids
- D) Micelles
- E) Steroids

Answer: A

- Explanation:
- A)
 - B)
 - C)
 - D)
 - E)

8) In chemical notation, the symbol Ca^{2+} means 8) _____
A) a calcium ion that has lost two electrons.
B) a calcium ion that has lost two protons.
C) two calcium atoms.
D) a calcium ion that has gained two electrons.
E) a calcium ion that has gained two protons.

Answer: A

Explanation: A)
B)
C)
D)
E)

9) Molecules that have the same molecular formula but different structural formulas are called 9) _____
A) isozymes. B) isotypes. C) isomoles. D) isotopes. E) isomers.

Answer: E

Explanation: A)
B)
C)
D)
E)

10) Which of the following is the symbol for an amino group? 10) _____
A) $-\text{NH}_2$ B) $-\text{OH}$ C) $-\text{COOH}$ D) $-\text{AMO}$ E) $-\text{PO}_3$

Answer: A

Explanation: A)
B)
C)
D)
E)

11) In dehydration reactions, compounds 11) _____
A) gain water molecules.
B) convert hydrogen and oxygen to water.
C) lose water molecules.
D) convert water molecules to hydrogen and oxygen.
E) gain electrons.

Answer: C

Explanation: A)
B)
C)
D)
E)

- 12) Of the list below, which has the highest concentration of hydroxide ions? 12) _____
A) pH 1 B) pH 14 C) pH 2 D) pH 10 E) pH 7
- Answer: B
Explanation: A)
 B)
 C)
 D)
 E)
- 13) An amino acid is to a protein as a _____ is to a nucleic acid. 13) _____
A) proton B) purine C) protein D) neutron E) nucleotide
- Answer: E
Explanation: A)
 B)
 C)
 D)
 E)
- 14) Individual steroids differ in the _____ attached to the carbon rings. 14) _____
A) side chains
B) main chains
C) proteins
D) cholesterol
E) glycoproteins
- Answer: A
Explanation: A)
 B)
 C)
 D)
 E)
- 15) Interaction between individual polypeptide chains to form a protein complex is _____ structure. 15) _____
A) secondary
B) primary
C) pentagonal
D) quaternary
E) tertiary
- Answer: D
Explanation: A)
 B)
 C)
 D)
 E)

- 16) Hydrophilic molecules readily associate with 16) _____
A) lipid molecules.
B) cholesterol.
C) both lipid molecules and hydrophobic molecules.
D) water molecules.
E) hydrophobic molecules.

Answer: D

Explanation: A)
B)
C)
D)
E)

- 17) The reaction $A + B + \text{energy} \rightarrow AB$ is an example of a(n) 17) _____
A) endergonic reaction.
B) exergonic reaction.
C) decomposition reaction.
D) exchange reaction.
E) equilibrium reaction.

Answer: A

Explanation: A)
B)
C)
D)
E)

- 18) When placed in water, an inorganic compound dissociates 99 percent, forming hydrogen ions and anions. This compound would be a 18) _____
A) salt.
B) strong base.
C) weak acid.
D) strong acid.
E) weak base.

Answer: D

Explanation: A)
B)
C)
D)
E)

- 19) If an isotope of oxygen has 8 protons, 10 neutrons, and 8 electrons, its mass number is 19) _____
A) 26. B) 16. C) 12. D) 18. E) 8.

Answer: D

Explanation: A)
B)
C)
D)
E)

20) Which of the following is/are inorganic substance(s)? 20) _____
A) water
B) carbon dioxide
C) fructose
D) glycerol
E) both water and carbon dioxide

Answer: E
Explanation: A)
 B)
 C)
 D)
 E)

21) The molecule CO₂ is known as 21) _____
A) carbonized oxygen.
B) carbon monoxide.
C) carbon oxide.
D) carbon dioxide.
E) carbonated oxygen.

Answer: D
Explanation: A)
 B)
 C)
 D)
 E)

22) In the reaction listed below, what coefficient needs to be added to balance the equation? 22) _____
 $6 \text{ CO}_2 + 6 \text{ H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + \text{_____ O}_2$
A) 6 B) 4 C) 10 D) 2 E) 8

Answer: A
Explanation: A)
 B)
 C)
 D)
 E)

23) A fatty acid that contains multiple double covalent bonds is said to be 23) _____
A) polyunsaturated.
B) carboxylated.
C) monounsaturated.
D) saturated.
E) hydrogenated.

Answer: A
Explanation: A)
 B)
 C)
 D)
 E)

24) Chemical reactions that yield energy, such as heat, are said to be 24) _____
A) thermonuclear.
B) endergonic.
C) activated.
D) exergonic.
E) neutral.

Answer: D

Explanation: A)
B)
C)
D)
E)

25) The _____ of a solution is the negative logarithm of the hydrogen ion concentration expressed in 25) _____
moles per liter.
A) pH
B) electropositivity
C) dissociation
D) electrical current
E) electronegativity

Answer: A

Explanation: A)
B)
C)
D)
E)

26) According to the rules of complementary base pairing in nucleic acids, cytosine would pair with 26) _____
the base
A) cytosine. B) adenine. C) uracil. D) thymine. E) guanine.

Answer: E

Explanation: A)
B)
C)
D)
E)

27) Oppositely charged ions in solution are prevented from combining by 27) _____
A) hydrogen bonding.
B) heat capacity of water.
C) hydration spheres.
D) free radicals.
E) water's nonpolar nature.

Answer: C

Explanation: A)
B)
C)
D)
E)

28) All fatty acids contain a functional group at one end called the _____ group. 28) _____
A) hydroxyl B) amino C) phosphate D) nitroxyl E) carboxyl

Answer: E

Explanation: A)
B)
C)
D)
E)

29) A polysaccharide that is formed in muscle cells to store glucose is 29) _____
A) lactose. B) cellulose. C) sucrose. D) fructose. E) glycogen.

Answer: E

Explanation: A)
B)
C)
D)
E)

30) Chemical reactions that release energy are called 30) _____

- A) energetic.
- B) exergonic.
- C) metabolic.
- D) enzymatic.
- E) endergonic.

Answer: B

Explanation: A)
B)
C)
D)
E)

31) Magnesium atoms have two electrons in their outermost shells and chlorine atoms have seven. The 31) _____
compound magnesium chloride would contain

- A) 2 magnesium and 1 chlorine.
- B) 1 magnesium and 2 chlorine.
- C) 2 magnesium and 7 chlorine.
- D) 1 magnesium and 1 chlorine.
- E) It is impossible to determine without more information.

Answer: B

Explanation: A)
B)
C)
D)
E)

32) The smallest stable units of matter are
A) neutrons. B) electrons. C) molecules. D) protons. E) atoms. 32) _____

Answer: E

Explanation: A)
B)
C)
D)
E)

33) Which of the following lists contains only trace elements? 33) _____

- A) cobalt, calcium, sodium
- B) boron, oxygen, carbon
- C) sulfur, chlorine, oxygen
- D) silicon, fluorine, tin
- E) selenium, hydrogen, calcium

Answer: D

Explanation: A)
B)
C)
D)
E)

34) The most abundant high-energy compound in cells is 34) _____

- A) RNA.
- B) adenosine monophosphate.
- C) adenosine triphosphate.
- D) DNA.
- E) adenosine diphosphate.

Answer: C

Explanation: A)
B)
C)
D)
E)

35) Which has the greater concentration of hydrogen ions, a substance with a pH of 5 or a substance with a pH of 4? 35) _____

- A) A pH of 5 is greater.
- B) A pH of 4 is greater.
- C) They are both equal; 4 and 5 are relative values.
- D) pH 9, if you mixed the solutions.
- E) Neither; pH has nothing to do with hydrogen ion concentration.

Answer: B

Explanation: A)
B)
C)
D)
E)

36) A(n) _____ is a homogeneous mixture containing a solvent and a solute.

36) _____

- A) organic molecule
- B) concoction
- C) inorganic molecule
- D) blend
- E) solution

Answer: E

- Explanation:
- A)
 - B)
 - C)
 - D)
 - E)

37) Ions with a + charge are called

37) _____

- A) cations. B) positrons. C) radicals. D) anions. E) isotopes.

Answer: A

- Explanation:
- A)
 - B)
 - C)
 - D)
 - E)

38) The nucleus of an atom consists of

38) _____

- A) protons.
- B) neutrons.
- C) electrons.
- D) protons + neutrons.
- E) protons + electrons.

Answer: D

- Explanation:
- A)
 - B)
 - C)
 - D)
 - E)

39) A dust particle floating on a water surface illustrates

39) _____

- A) hydrophilic attraction.
- B) surface tension.
- C) chemical tension.
- D) heat capacity.
- E) static electricity.

Answer: B

- Explanation:
- A)
 - B)
 - C)
 - D)
 - E)

40) The chemical behavior of an atom is determined by the _____
A) mass of the nucleus.
B) number of neutrons.
C) number of protons.
D) outermost electron shell.
E) size of the atom.

Answer: D

Explanation: A)
B)
C)
D)
E)

41) The reaction $N_2 + 3 H_2 \rightarrow 2 NH_3$ is an example of a(n) _____
A) synthesis reaction.
B) metabolic reaction.
C) exchange reaction.
D) decomposition reaction.
E) enzyme reaction.

Answer: A

Explanation: A)
B)
C)
D)
E)

42) Magnesium atoms have two electrons in the outermost shell. As a result, you would expect magnesium to form ions with a charge of _____
A) +1.
B) -2.
C) +2.
D) -1.
E) either +2 or -2.

Answer: C

Explanation: A)
B)
C)
D)
E)

43) An important buffer in body fluids is _____
A) NaOH. B) $NaHCO_3$. C) H_2O . D) HCl. E) NaCl.

Answer: B

Explanation: A)
B)
C)
D)
E)

44) Atoms of the same element whose nuclei contain the same number of protons, but different numbers of neutrons, are called 44) _____
A) isotopes.
B) trace elements.
C) ions.
D) principal elements.
E) isomers.

Answer: A

Explanation: A)
B)
C)
D)
E)

45) Ionic bonds are formed when 45) _____
A) a pair of electrons is shared unequally by two atoms.
B) electrons are completely transferred from one atom to another.
C) hydrogen forms bonds with negatively charged atoms.
D) atoms share electrons.
E) two or more atoms lose electrons at the same time.

Answer: B

Explanation: A)
B)
C)
D)
E)

46) Isotopes of an element differ in the number of 46) _____
A) electrons in energy shells.
B) neutrons in the nucleus.
C) electron clouds.
D) protons in the nucleus.
E) electrons in the nucleus.

Answer: B

Explanation: A)
B)
C)
D)
E)

47) The mass of an atom is largely determined by the number of _____ it has. 47) _____
A) neutrons
B) protons
C) electrons
D) protons + neutrons
E) protons + electrons

Answer: D

Explanation: A)
B)
C)
D)
E)

- 48) In an aqueous solution, sodium ions would move toward
- A) an organic terminal.
 - B) a positive terminal.
 - C) the bottom.
 - D) a pH terminal.
 - E) a negative terminal.

48) _____

Answer: E

Explanation: A)
B)
C)
D)
E)

- 49) Lipids
- A) cushion organs against shocks.
 - B) help to maintain body temperature.
 - C) form essential structural components of cells.
 - D) provide roughly twice the energy as carbohydrates.
 - E) All of the answers are correct.

49) _____

Answer: E

Explanation: A)
B)
C)
D)
E)

- 50) Compounds that can be synthesized or broken down by chemical reactions inside the body are called
- A) nutrients.
 - B) organic compounds.
 - C) enzymes.
 - D) inorganic compounds.
 - E) metabolites.

50) _____

Answer: E

Explanation: A)
B)
C)
D)
E)

- 51) The actual mass of an atom is known as its
- A) atomic weight.
 - B) atomic mass unit.
 - C) element number.
 - D) atomic number.
 - E) mass number.

51) _____

Answer: A

Explanation: A)
B)
C)
D)
E)

52) The term _____ means each enzyme catalyzes only one type of reaction. 52) _____
A) activation
B) inertia
C) specificity
D) saturation
E) monoreactive

Answer: C

Explanation: A)
B)
C)
D)
E)

53) Each of the following is an example of an inorganic compound except 53) _____
A) proteins. B) salts. C) bases. D) water. E) acids.

Answer: A

Explanation: A)
B)
C)
D)
E)

54) Which pH is closest to normal blood pH? 54) _____
A) pH 3 B) pH 2 C) pH 7 D) pH 4 E) pH 8

Answer: C

Explanation: A)
B)
C)
D)
E)

55) A high-energy bond in ATP is present between 55) _____
A) adenine and a phosphate group.
B) adenine and ribose.
C) the first and second phosphate group.
D) the second and third phosphate group.
E) the first and second, and the second and third, phosphate groups.

Answer: E

Explanation: A)
B)
C)
D)
E)

56) The pyrimidine bases found in DNA are _____ and _____.

56) _____

- A) thymine; guanine
- B) adenine; guanine
- C) cytosine; guanine
- D) thymine; cytosine
- E) adenine; cytosine

Answer: D

- Explanation:
- A)
 - B)
 - C)
 - D)
 - E)

57) Which of the following statements about water is not correct?

57) _____

- A) It is responsible for much of the mass of the human body.
- B) It is composed of polar molecules.
- C) It contains hydrogen bonds.
- D) It can dissolve many substances.
- E) It has a relatively low heat capacity.

Answer: E

- Explanation:
- A)
 - B)
 - C)
 - D)
 - E)

58) The most important metabolic fuel molecule in the body is

58) _____

- A) sucrose. B) protein. C) caffeine. D) vitamins. E) glucose.

Answer: E

- Explanation:
- A)
 - B)
 - C)
 - D)
 - E)

59) Adenosine is formed by combining

59) _____

- A) adenine and phosphate group.
- B) ribose and a phosphate group.
- C) adenine, ribose, and 3 phosphate groups.
- D) adenine and ribose.
- E) adenine, ribose, and a phosphate group.

Answer: D

- Explanation:
- A)
 - B)
 - C)
 - D)
 - E)

60) Which of the following is both an anion and a compound? 60) _____

- A) Cl^- B) Na^+ C) K^+ D) NaCl E) HCO_3^-

Answer: E

- Explanation: A)
B)
C)
D)
E)

61) A solution containing equal numbers of hydrogen ions and hydroxide ions is 61) _____

- A) basic.
B) neutral.
C) acidic.
D) alkaline.
E) in equilibrium.

Answer: B

- Explanation: A)
B)
C)
D)
E)

62) The purines found in DNA are _____ and _____. 62) _____

- A) thymine; guanine
B) adenine; cytosine
C) adenine; guanine
D) cytosine; guanine
E) thymine; cytosine

Answer: C

- Explanation: A)
B)
C)
D)
E)

63) The innermost electron shell in an atom holds up to _____ electrons. 63) _____

- A) 1 B) 2 C) 4 D) 6 E) 8

Answer: B

- Explanation: A)
B)
C)
D)
E)

64) When atoms complete their outer electron shell by sharing electrons, they form _____
A) hydrogen bonds.
B) ionic bonds.
C) cations.
D) covalent bonds.
E) anions.

Answer: D

Explanation: A)
B)
C)
D)
E)

65) A(n) _____ removes hydrogen ions, and a(n) _____ releases hydrogen ions. _____
A) compound; element
B) acid; base
C) molecule; acid
D) base; acid
E) element; compound

Answer: D

Explanation: A)
B)
C)
D)
E)

66) The three familiar states of matter listed in order from the least to most thermal energy are _____
A) solid, gas, liquid.
B) gas, liquid, solid.
C) gas, solid, liquid.
D) solid, liquid, gas.
E) liquid, gas, solid.

Answer: B

Explanation: A)
B)
C)
D)
E)

67) If an element is composed of atoms with an atomic number of 6 and a mass number of 14, then the nucleus of a neutral atom of this element contains _____
A) 6 protons.
B) 8 neutrons.
C) 8 electrons.
D) 6 protons and 8 electrons.
E) 6 protons and 8 neutrons.

Answer: E

Explanation: A)
B)
C)
D)
E)

68) _____ are soluble inorganic compounds whose solutions will conduct an electric current.

68) _____

- A) Electrolytes
- B) Lipids
- C) Proteins
- D) Enzymes
- E) Ions

Answer: A

- Explanation:
- A)
 - B)
 - C)
 - D)
 - E)

69) _____ compounds do not usually contain carbon as a primary structural atom.

69) _____

- A) Organic
- B) Complex
- C) Endergonic
- D) Exergonic
- E) Inorganic

Answer: E

- Explanation:
- A)
 - B)
 - C)
 - D)
 - E)

70) An excess of hydrogen ions in the body fluids can have fatal results because this can

70) _____

- A) block ion movements.
- B) disrupt tissue functions.
- C) change the shape of large complex molecules, rendering them nonfunctional.
- D) All of the answers are correct.
- E) None of the answers is correct.

Answer: D

- Explanation:
- A)
 - B)
 - C)
 - D)
 - E)

71) The molecule O₂ is known as

71) _____

- A) organic.
- B) oxyous.
- C) oxygen.
- D) oxygen and organic.
- E) oxide.

Answer: C

- Explanation:
- A)
 - B)
 - C)
 - D)
 - E)

72) H₂O is an example of a(n) 72) _____
A) molecular formula. B) covalent formula.
C) ionic formula. D) glucose molecule.

Answer: A
Explanation: A)
 B)
 C)
 D)

73) Which of the following substances would be most acidic? 73) _____
A) stomach secretions, pH = 1
B) tomato juice, pH = 4
C) white wine, pH = 3
D) urine, pH = 6
E) lemon juice, pH = 2

Answer: A
Explanation: A)
 B)
 C)
 D)
 E)

74) _____ accelerate chemical reactions that occur in the human body. 74) _____
A) Reactants
B) Metabolites
C) Enzymes
D) Nutrients
E) Products

Answer: C
Explanation: A)
 B)
 C)
 D)
 E)

75) When a small amount of HCl or NaOH is added to a solution of Na₂HPO₄, the pH of the solution 75) _____
barely changes. Based on these observations, all of the following are true concerning the compound Na₂HPO₄ except
A) Na₂HPO₄ is able to donate hydrogen ions to the OH⁻ from NaOH.
B) Na₂HPO₄ acts as a buffer.
C) Na₂HPO₄ adsorbs excess H⁺ and OH⁻ directly onto the surface of its crystalline structure.
D) Na₂HPO₄ is able to accept extra hydrogen ions from the HCl.
E) Na₂HPO₄ is a salt formed from reacting a strong base with a weak acid.

Answer: C
Explanation: A)
 B)
 C)
 D)
 E)

76) The group of organic compounds containing carbon, hydrogen, and oxygen in a near 1:2:1 ratio is defined as a _____
A) carbohydrate.
B) cholesterol.
C) lipid.
D) protein.
E) nucleic acid.

Answer: A

Explanation: A)
B)
C)
D)
E)

77) Molecules that store and process genetic information are the _____
A) proteins.
B) carbohydrates.
C) nucleic acids.
D) steroids.
E) lipids.

Answer: C

Explanation: A)
B)
C)
D)
E)

78) A side chain, or side group, on an amino acid is sometimes called _____
A) an isozyme.
B) a polypeptide chain.
C) nucleic acid.
D) an R group.
E) fibrous or globular.

Answer: D

Explanation: A)
B)
C)
D)
E)

79) Carbohydrates, lipids, and proteins are classified as _____
A) inorganic molecules.
B) acids.
C) organic molecules.
D) salts.
E) bases.

Answer: C

Explanation: A)
B)
C)
D)
E)

80) Lipids that are produced by nearly every tissue in the body and that act as local regulators of cell activities are the _____
A) phospholipids.
B) prostaglandins.
C) glycolipids.
D) steroids.
E) monoglycerides.

Answer: B

Explanation: A)
B)
C)
D)
E)

81) Which of the following is not a cation? _____
A) Cl^- B) K^+ C) Mg^{2+} D) Na^+ E) Ca^{2+}

Answer: A

Explanation: A)
B)
C)
D)
E)

82) Chemical reactions that absorb energy are called _____
A) energetic.
B) endergonic.
C) metabolic.
D) exergonic.
E) enzymatic.

Answer: B

Explanation: A)
B)
C)
D)
E)

83) The atomic weight of an atom reflects the average number of _____
A) neutrons.
B) protons.
C) electrons.
D) protons + neutrons.
E) protons + neutrons + electrons.

Answer: E

Explanation: A)
B)
C)
D)
E)

- 84) In a molecule of oxygen gas, two pairs of electrons are shared equally by two oxygen atoms. The type of bond that is formed is an example of a _____ 84) _____
- A) hydrogen bond.
 - B) double polar covalent bond.
 - C) triple nonpolar covalent bond.
 - D) single trivalent bond.
 - E) double nonpolar covalent bond.

Answer: E

Explanation: A)
B)
C)
D)
E)

- 85) A functional group is best described as reoccurring clusters of _____ 85) _____
- A) atoms that greatly influence the chemical properties of molecules they are part of.
 - B) elements that occur in a salt.
 - C) amino acids in a globular protein.
 - D) elements that form at high pH.
 - E) atoms that function in the body.

Answer: A

Explanation: A)
B)
C)
D)
E)

- 86) An example of an organic substance is _____ 86) _____
- A) sodium chloride.
 - B) sucrose.
 - C) carbon dioxide.
 - D) oxygen.
 - E) carbonic acid.

Answer: B

Explanation: A)
B)
C)
D)
E)

- 87) When two monosaccharides undergo a dehydration synthesis, _____ 87) _____
- A) two new monosaccharides are formed.
 - B) a starch is formed.
 - C) a polysaccharide is formed.
 - D) a disaccharide is formed.
 - E) All of the answers are correct.

Answer: D

Explanation: A)
B)
C)
D)
E)

- 88) Adenine and guanine are 88) _____
A) purines represented by A and G.
B) purines represented by T and C.
C) nucleotides represented by A and G.
D) pyrimidines represented by A and G.
E) pyrimidines represented by T and C.

Answer: A

Explanation: A)
B)
C)
D)
E)

- 89) Which of the following statements about hydrogen bonds is false? 89) _____
A) Hydrogen bonds can form between neighboring molecules.
B) Hydrogen bonds are responsible for many of the properties of water.
C) Hydrogen bonds are strong attractive forces between hydrogen atoms and negatively charged atoms.
D) Hydrogen bonds are important for holding large molecules together.
E) Hydrogen bonds can occur within a single molecule.

Answer: C

Explanation: A)
B)
C)
D)
E)

- 90) In the body, inorganic compounds 90) _____
A) can make up proteins.
B) are all very large.
C) can serve as buffers.
D) can make up lipids.
E) are structural components of cells.

Answer: C

Explanation: A)
B)
C)
D)
E)

- 91) The alpha-helix and pleated sheet are examples of _____ protein structure. 91) _____
A) pentagonal
B) tertiary
C) secondary
D) primary
E) quaternary

Answer: C

Explanation: A)
B)
C)
D)
E)

- 92) Kinetic energy is stored as _____ energy when a spring is stretched. 92) _____
A) motion B) chemical C) thermal D) potential E) work
- Answer: D
Explanation: A)
 B)
 C)
 D)
 E)
- 93) _____ molecules are compounds that contain carbon as the primary structural atom. 93) _____
A) Complex
B) Inorganic
C) Organic
D) Endergonic
E) Exergonic
- Answer: C
Explanation: A)
 B)
 C)
 D)
 E)
- 94) When electrons are transferred from one atom to another, and the two atoms unite as a result of the opposite charges, 94) _____
A) an ionic bond is formed.
B) a hydrogen bond is formed.
C) a free electron is formed.
D) an ion is formed.
E) a covalent bond is formed.
- Answer: A
Explanation: A)
 B)
 C)
 D)
 E)
- 95) During ionization, water molecules disrupt the ionic bonds of a salt to produce a mixture of ions. 95) _____
These ions can carry a current and so are called
A) counter ions.
B) electrolytes.
C) cations.
D) anions.
E) acids.
- Answer: B
Explanation: A)
 B)
 C)
 D)
 E)

96) What is the product formed from the addition of a phosphate group to ADP?

96) _____

- A) adenine
- B) adenosine triphosphate
- C) ribose
- D) deoxyribonucleic acid
- E) adenosine diphosphate

Answer: B

- Explanation:
- A)
 - B)
 - C)
 - D)
 - E)

97) Molecules that do not readily dissolve in water are called

97) _____

- A) electrolytes.
- B) hydrophilic.
- C) isophobic.
- D) hydrophobic.
- E) isophilic.

Answer: D

- Explanation:
- A)
 - B)
 - C)
 - D)
 - E)

98) In hydrolysis reactions, compounds react with

98) _____

- A) carbon, causing decomposition.
- B) glucose, causing decomposition.
- C) water, causing synthesis.
- D) hydrogen, causing decomposition.
- E) water, causing decomposition.

Answer: E

- Explanation:
- A)
 - B)
 - C)
 - D)
 - E)

99) The molecule H_2 is known as

99) _____

- A) semi-water.
- B) hydroxide.
- C) hydrogen.
- D) hydrohydrogen.
- E) helium.

Answer: C

- Explanation:
- A)
 - B)
 - C)
 - D)
 - E)

100) By weight, which element is the most plentiful in the human body? 100) _____
A) sulfur B) carbon C) sodium D) oxygen E) potassium

Answer: D

Explanation: A)
B)
C)
D)
E)

101) $AB \rightarrow A + B$ is to decomposition as $A + B \rightarrow AB$ is to 101) _____

- A) exchange.
- B) metabolism.
- C) synthesis.
- D) combustion.
- E) replacement.

Answer: C

Explanation: A)
B)
C)
D)
E)

102) If a substance has a pH that is greater than 7, it is 102) _____
A) a buffer. B) neutral. C) acidic. D) a salt. E) alkaline.

Answer: E

Explanation: A)
B)
C)
D)
E)

103) $AMP + P \rightarrow$ 103) _____
A) adenine B) 2ADP C) DNA D) ATP E) ADP

Answer: E

Explanation: A)
B)
C)
D)
E)

104) The maximum rate of an enzyme reaction occurs at _____
A) hydrolysis.
B) dehydration.
C) reversible.
D) synthesis.
E) saturation limit.

Answer: E

Explanation: A)
B)
C)
D)
E)

105) Which of the following is/are needed to form a triglyceride molecule? _____
A) 1 glycerol molecule
B) 3 fatty acid molecules
C) 3 glycerol molecules
D) 3 glycerol + 3 fatty acid molecules
E) 1 glycerol + 3 fatty acid molecules

Answer: E

Explanation: A)
B)
C)
D)
E)

106) If one pair of electrons is unequally shared between two atoms, a _____ occurs. _____
A) double nonpolar covalent bond
B) single polar covalent bond
C) double polar covalent bond
D) hydrogen bond
E) single nonpolar covalent bond

Answer: B

Explanation: A)
B)
C)
D)
E)

107) Of the following choices, the pH of the least acidic solution is _____
A) 2.3. B) 12.0. C) 6.0. D) 1.0. E) 4.5.

Answer: B

Explanation: A)
B)
C)
D)
E)

108) A nucleotide consists of a _____
A) five-carbon sugar, a nitrogenous base, and a phosphate group.
B) phosphate group and a nitrogenous base.
C) five-carbon sugar and a nitrogenous base.
D) five-carbon sugar and an amino acid.
E) five-carbon sugar and phosphate group.

Answer: A

Explanation: A)
B)
C)
D)
E)

109) Substrate molecules bind to enzymes at the _____ sites.
A) reactant B) neutral C) amino D) active E) carboxyl

Answer: D

Explanation: A)
B)
C)
D)
E)

110) A shortage of cholesterol in the body could interfere with the formation of _____
A) cytoplasm.
B) proteins.
C) sex hormones.
D) nucleic acids.
E) glycogen.

Answer: C

Explanation: A)
B)
C)
D)
E)

111) Lipids made of a glycerol molecule with two fatty acids attached to one side and a phosphate group connecting a nonlipid group attached to the other are _____
A) cholesterols.
B) phospholipids.
C) triglycerides.
D) monoglycerides.
E) prostaglandins.

Answer: C

Explanation: A)
B)
C)
D)
E)

112) Oxygen is required in biological systems for _____
A) serving as a structural component of bone.
B) serving as a catalyst.
C) cellular respiration.
D) storage of energy.
E) chemical messengers.

Answer: C

Explanation: A)
B)
C)
D)
E)

113) A(n) _____ is a pure substance composed of atoms. _____
A) element
B) electron
C) neutron
D) molecule
E) compound

Answer: A

Explanation: A)
B)
C)
D)
E)

114) Adding a phosphate group to adenosine forms _____
A) 2ATP. B) ribose. C) ATP. D) ADP. E) AMP.

Answer: E

Explanation: A)
B)
C)
D)
E)

115) Which element commonly has only a proton as its nucleus? _____
A) neon
B) argon
C) hydrogen
D) helium
E) None of the answers is correct.

Answer: C

Explanation: A)
B)
C)
D)
E)

116) Cholesterol, phospholipids, and glycolipids are examples of _____
A) lipid drugs.
B) prostaglandins.
C) structural lipids.
D) steroids.
E) dietary fats.

Answer: C

Explanation: A)
B)
C)
D)
E)

117) Each amino acid differs from another in the _____
A) nature of the side chain.
B) number of carboxyl groups.
C) size of the amino group.
D) number of peptide bonds in the molecule.
E) number of central carbon atoms.

Answer: A

Explanation: A)
B)
C)
D)
E)

118) In an aqueous solution, cations are attracted toward _____
A) buffers.
B) hydrogen ions.
C) anions.
D) water.
E) salt.

Answer: C

Explanation: A)
B)
C)
D)
E)

119) The center of an atom is called the _____
A) nucleus.
B) proton.
C) molecule.
D) element.
E) electron cloud.

Answer: A

Explanation: A)
B)
C)
D)
E)

120) Carbohydrate molecules 120) _____
A) form the regulatory molecules known as enzymes.
B) contain the genetic information found in cells.
C) are composed of C, H, O, and N atoms.
D) are the building blocks of cellular membranes.
E) are the body's most readily available source of energy.

Answer: E

Explanation: A)
B)
C)
D)
E)

121) The "atomic number" of an atom is determined by the number of _____ it has. 121) _____
A) neutrons
B) protons
C) electrons
D) protons + neutrons
E) protons + electrons

Answer: B

Explanation: A)
B)
C)
D)
E)

122) In living cells, complex metabolic reactions proceed in a series of steps called 122) _____
A) reactants.
B) products.
C) enzymes.
D) catalysts.
E) a metabolic pathway.

Answer: E

Explanation: A)
B)
C)
D)
E)

123) Fructose 123) _____
A) is found in fruits.
B) is a hexose.
C) is an isomer of glucose.
D) All of the answers are correct.
E) None of the answers is correct.

Answer: D

Explanation: A)
B)
C)
D)
E)

124) All of the following are true concerning enzymes except that they _____
A) function as biological catalysts.
B) are proteins.
C) affect only the rate of a chemical reaction.
D) lower the activation energy required for a reaction.
E) are consumed during the reaction.

Answer: E

Explanation: A)
B)
C)
D)
E)

125) The weakest bond between two atoms is the _____ bond. _____
A) polar B) ionic C) nonpolar D) covalent E) hydrogen

Answer: E

Explanation: A)
B)
C)
D)
E)

126) In water, fatty acids tend to form tiny droplets with hydrophobic tails buried inside called _____
A) eicosanoids.
B) prostaglandins.
C) micelles.
D) phospholipids.
E) steroids.

Answer: C

Explanation: A)
B)
C)
D)
E)

127) You would expect a peptide bond to link _____
A) two amino acids.
B) two simple sugars.
C) a peptide and a fatty acid.
D) two nucleotides.
E) a sugar and a peptide.

Answer: A

Explanation: A)
B)
C)
D)
E)

128) By weight, which element is the second most abundant in the human body? 128) _____
A) calcium B) nitrogen C) oxygen D) carbon E) hydrogen

Answer: D

Explanation: A)
 B)
 C)
 D)
 E)

129) Which property of water helps keep body temperature stabilized? 129) _____

- A) reactivity
- B) surface tension
- C) kinetic energy
- D) thermal inertia
- E) lubrication

Answer: D

Explanation: A)
 B)
 C)
 D)
 E)

130) The structure of RNA differs from DNA in that 130) _____

- A) RNA contains pyrimidines but not purines.
- B) DNA contains purines but not pyrimidines.
- C) the backbone of RNA contains ribose.
- D) DNA contains pyrimidines but not purines.
- E) RNA contains purines but not pyrimidines.

Answer: C

Explanation: A)
 B)
 C)
 D)
 E)

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

131) Justify why blood has a very narrow normal pH range. What happens if the blood pH gets too high or too low?

Answer: Homeostasis requires that the pH of body fluids be maintained almost constant to avoid disruptions of normal cell and tissue function. If the pH of the blood and body fluids gets too high, alkalosis occurs, causing uncontrollable muscle contractions. If the pH of the blood and body fluids gets too low, acidosis occurs and will result in coma and death.

132) Explain the role of water molecules in polysaccharide formation.

Answer: Water molecules are removed in the dehydration synthesis of polysaccharides.

133) Predict what will happen in the human body when a person ingests a large amount of Roloids[®], i.e., a base.

Answer: Because the Roloids[®] are a base, they would neutralize some of the acid in the stomach. If enough of the acid is neutralized, the body's buffer systems would need to correct the pH shift.

134) Identify the three structural components of a nucleotide.

Answer: sugar (pentose); phosphate group; nitrogenous base

135) How does the DNA molecule control the appearance and function of a cell?

Answer: The DNA molecule controls the synthesis of enzymes and structural proteins. By controlling the synthesis of structural proteins, the DNA is able to influence the physical appearance of a cell. By controlling the production of enzymes, the DNA is able to control all aspects of cellular metabolism and thus control the activity and biological functions of the cell.

136) Compare and contrast ionic and covalent bonds.

Answer: An ionic bond is when one molecule loses an electron and gives it to another molecule. One molecule becomes positive and the other one becomes negative. This forms a weak magnetic attraction between the two molecules. A covalent bond is when two or more molecules share an electron with each other. The bond is much stronger than an ionic bond.

Answer Key
Testname: C2

- 1) D
- 2) A
- 3) D
- 4) A
- 5) A
- 6) C
- 7) A
- 8) A
- 9) E
- 10) A
- 11) C
- 12) B
- 13) E
- 14) A
- 15) D
- 16) D
- 17) A
- 18) D
- 19) D
- 20) E
- 21) D
- 22) A
- 23) A
- 24) D
- 25) A
- 26) E
- 27) C
- 28) E
- 29) E
- 30) B
- 31) B
- 32) E
- 33) D
- 34) C
- 35) B
- 36) E
- 37) A
- 38) D
- 39) B
- 40) D
- 41) A
- 42) C
- 43) B
- 44) A
- 45) B
- 46) B
- 47) D
- 48) E
- 49) E
- 50) E

Answer Key
Testname: C2

- 51) A
- 52) C
- 53) A
- 54) C
- 55) E
- 56) D
- 57) E
- 58) E
- 59) D
- 60) E
- 61) B
- 62) C
- 63) B
- 64) D
- 65) D
- 66) B
- 67) E
- 68) A
- 69) E
- 70) D
- 71) C
- 72) A
- 73) A
- 74) C
- 75) C
- 76) A
- 77) C
- 78) D
- 79) C
- 80) B
- 81) A
- 82) B
- 83) E
- 84) E
- 85) A
- 86) B
- 87) D
- 88) A
- 89) C
- 90) C
- 91) C
- 92) D
- 93) C
- 94) A
- 95) B
- 96) B
- 97) D
- 98) E
- 99) C
- 100) D

Answer Key

Testname: C2

- 101) C
- 102) E
- 103) E
- 104) E
- 105) E
- 106) B
- 107) B
- 108) A
- 109) D
- 110) C
- 111) C
- 112) C
- 113) A
- 114) E
- 115) C
- 116) C
- 117) A
- 118) C
- 119) A
- 120) E
- 121) B
- 122) E
- 123) D
- 124) E
- 125) E
- 126) C
- 127) A
- 128) D
- 129) D
- 130) C
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