Exam

Name_____

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

1) Which of the following statements best describes a compound? 1) _____
A) A compound is a pure element.
B) A compound is a solution.
C) A compound contains two or more different elements in a fixed ratio.
D) A compound is exemplified by sodium.

2) Lactose intolerance is the inability to 2) _____
A) digest cellulose.
B) produce milk proteins.
C) produce lactose.
D) digest lactose.

3) Lactose intolerance 3) _____
A) is common in people of all ages, from infancy to adulthood.
B) does not affect the consumption of beverages made from soy or rice.
C) is most common in people of European descent.
D) can currently be treated by gene therapy to treat the underlying cause.

4) Organic compounds 4) _____
A) are synthesized only by animal cells.
B) always contain carbon.
C) always contain nitrogen.
D) always contain oxygen.

5) Which of the following statements regarding carbon is *false*? 5) _____
A) Carbon has a tendency to form covalent bonds.
B) Carbon has the ability to bond together to form extensive, branched, or unbranched "carbon skeletons."
C) Carbon has the capacity to form single and double bonds.
D) Carbon has the ability to bond with up to six other atoms.

6) Which of the following statements about hydrocarbons is *false*? 6) _____
A) Hydrocarbons consist of atoms linked by single and double bonds.
B) Hydrocarbons contain only carbon and hydrogen atoms.
C) Hydrocarbons can form straight, branched or ringed structures.
D) Hydrocarbons are inorganic compounds.

7) Propanol and isopropanol are isomers. This means that they have 7) _____
A) different molecular formulas, but the same chemical properties.
B) the same molecular formula, but different chemical properties.
C) the same molecular formula, but represent different states of the compound.
D) the same molecular formula and the same chemical properties.

8) A hydroxyl group is 8) _____
A) characteristic of alcohols.
B) basic.
C) also called a carbonyl group.
D) characteristic of proteins.

9) Which of the following is a carboxyl group? 9) _____
A) —NH_2 B) —COOH C) —C═O D) —OH

10) Which of the following is an amino group? 10) _____
A) —OH B) —COOH C) —NH_2 D) —CO

11) Which of the following statements about the functional groups of organic compounds is *false*? 11) _____
A) Functional groups help make organic compounds hydrophilic.
B) All functional groups include a carbon atom.
C) Many biological molecules have two or more functional groups.
D) Functional groups participate in chemical reactions.

12) Which of the following contains a carboxyl and an amino group? 12) _____
A) amino acids B) sugars C) vinegar D) fats

13) Which of the following functional groups is capable of regulating gene expression? 13) _____
A) —CH_3 B) —CO C) —OH D) —COOH

14) Which of the following statements about the monomers and polymers found in living organisms is *false*? 14) _____
A) The monomers used to make polymers are essentially universal.
B) Cells typically make all of their macromolecules from a set of 40–50 common monomers and a few other ingredients that are rare.
C) Monomers are joined together by the process of hydrolysis.
D) Monomers serve as building blocks for polymers.

15) Which of the following statements about dehydration synthesis is *false*? 15) _____
A) Animal digestive systems utilize this process to break down food.
B) One monomer loses a hydrogen atom, and the other loses a hydroxyl group.
C) Covalent bonds are formed between the monomers.
D) H_2O is formed as the monomers are joined.

16) The results of dehydration synthesis can be reversed by 16) _____
A) condensation. B) polymerization.
C) the addition of an amino group. D) hydrolysis.

17) What is the general function of enzymes within a cell? 17) _____
A) to promote the synthesis of monomers B) to induce chemical reactions
C) to speed up chemical reactions D) to stop chemical reactions

18) The molecular formula of most monosaccharides represents a multiple of 18) _____
A) CHO_2. B) CHO. C) CH_3O. D) CH_2O.

19) A molecule with the formula $C_{55}H_{110}O_{55}$ is probably a(n) 19) _____
A) steroid. B) oil. C) protein. D) polysaccharide.

20) Many names for sugars end in the suffix 20) _____
A) –ose. B) –acid. C) –ase. D) –hyde.

21) Sucrose is formed 21) _____
A) from two glucose molecules.
B) when glucose and lactose are combined.
C) from two monosaccharides through dehydration synthesis.
D) when ionic bonds link two monosaccharides.

22) A disaccharide forms when 22) _____
A) two starches join by dehydration synthesis.
B) two monosaccharides join by dehydration synthesis.
C) two monosaccharides join by hydrolysis.
D) two starches join by hydrolysis.

23) High–fructose corn syrup is made from corn. The main carbohydrate in corn is a polysaccharide called 23) _____
A) hydrocarbon. B) cellulose. C) starch. D) fructose.

24) Which of the following lists contains *only* polysaccharides? 24) _____
A) starch, amino acids, and glycogen B) cellulose, starch, and glycogen
C) fructose, cellulose, and glucose D) sucrose, starch, and cellulose

25) Cellulose differs from starch in that 25) _____
A) glycogen is formed by plants and cellulose by animals.
B) cellulose is highly branched, whereas starch is unbranched.
C) starch is made of glucose monomers, whereas cellulose is made of fructose monomers.
D) most animals cannot break down cellulose, whereas starch is easily digested.

26) Foods that are high in fiber are most likely derived from 26) _____
A) red meats. B) plants. C) dairy products. D) fish.

27) Cows can derive nutrients from cellulose because 27) _____
A) they produce the enzymes that break down cellulose.
B) their intestinal tract contains cellulose–hydrolyzing microorganisms.
C) they chew their food so thoroughly that cellulose fibers are broken down.
D) they convert cellulose into starch, which is easily broken down in the intestinal tract.

28) The storage form of carbohydrates is _____ in animals and _____ in plants. 28) _____
A) starch . . . glycogen B) cellulose . . . glycogen
C) glycogen . . . cellulose D) glycogen . . . starch

29) Which of the following organisms contain the polysaccharide chitin? 29) _____
A) plants and bacteria B) animals and plants
C) insects and plants D) fungi and insects

30) An oil may be converted into a substance that is solid at room temperature by 30) _____
A) adding hydrogens, decreasing the number of double bonds in the molecules.
B) cooling it, so that double bonds form and the fats solidify.
C) removing hydrogens, increasing the number of double bonds.
D) removing water, causing a dehydration synthesis reaction to occur.

31) A diet high in animal products and hydrogenated vegetable margarine may increase the risk for atherosclerosis. This is because 31) _____
A) most animal fats are saturated and many hydrogenated vegetable margarines contain high levels of trans fats.
B) most hydrogenated vegetable margarines are hydrogenated oils and most animal products contain high levels of phospholipids.
C) most animal fats are used for energy storage and most hydrogenated vegetable margarines contain high levels of unsaturated fats.
D) most animal fats are unsaturated and most hydrogenated vegetable margarines contain high levels of steroids.

32) What feature of fats makes them hydrophobic? 32) _____
A) Fats have nonpolar hydrocarbon chains. B) Fats have carboxyl groups.
C) Fats have polar fatty acids. D) Fats include one glycerol molecule.

33) Fatty acids are 33) _____
A) composed of four linked rings.
B) composed of carbon, hydrogen, glycerol, and a phosphate group.
C) hydrophobic.
D) composed of carbon, hydrogen, and oxygen in a 1:2:1 ratio.

34) Which of the following statements regarding triglyceride molecules is *false*? 34) _____
A) Triglycerides are a type of fat.
B) Triglycerides are hydrophilic.
C) Triglycerides consist of three fatty acids attached to a glycerol.
D) Triglycerides play a role in energy storage.

35) Fatty acids with double bonds between some of their carbons are said to be 35) _____
A) monoglycerides. B) completely hydrogenated.
C) unsaturated. D) saturated.

36) The development of atherosclerotic disease can result from a diet high in 36) _____
A) protein. B) saturated fats. C) fiber. D) sugars.

37) If you were to add olive oil to your food as part of a diet to lower your risk of atherosclerotic disease, you would use olive oil that 37) _____
A) is hydrogenated.
B) is liquid at room temperature.
C) has lard added to it.
D) is modified to be solid at room temperature.

38) Which of the following statements about animal cell lipids is *false*? 38) _____
A) Phospholipids are important components of cell membranes.
B) Cholesterol is a type of lipid that is a component of cell membranes and steroid hormones.
C) Fats are a form of lipid that function to store energy.
D) Many lipids function as enzymes.

39) A phospholipid is composed of 39) _____
A) one glycerol molecule linked to one phosphate group and two fatty acids.
B) one glycerol molecule linked to three phosphate groups.
C) one fatty acid molecule linked to three glycerol molecules.
D) one fatty acid molecule linked to one glycerol molecule and two phosphate groups.

40) Which of the following substances is a lipid? 40) _____
A) DNA B) enzymes C) steroids D) cellulose

41) A major type of lipid found in cell membranes is 41) _____
A) waxes. B) phospholipids. C) triglycerides. D) glycerol.

42) Which of the following statements about anabolic steroids is *false*? 42) _____
A) They promote bone growth.
B) They often cause the body to reduce its normal output of sex hormones.
C) They can stimulate mood swings and violent behavior.
D) They cause a general buildup of muscle mass.

43) Amino acids can be distinguished from one another by 43) _____
A) the chemical properties of their R groups.
B) the number of R groups found on the amino acid molecules.
C) the chemical properties of their amino and carboxyl groups.
D) the type of bond between the R group and the rest of the amino acid molecule.

44) Proteins differ from one another because 44) _____
A) each protein contains its own unique sequence of sugar molecules.
B) the peptide bonds linking amino acids differ from protein to protein.
C) the sequence of amino acids in the polypeptide chain differs from protein to protein.
D) the number of nucleotides found in each protein varies from molecule to molecule.

45) Glucose molecules are to starch as _____ are to proteins. 45) _____
A) monosaccharides B) fatty acids
C) amino acids D) oils

46) Peptide bonds 46) _____
A) are used to form amino acids. B) link amino acids.
C) form between fatty acids. D) are formed by a hydrolysis reaction.

47) Which of the following statements about enzymes is *false*? 47) _____
A) They regulate virtually all chemical reactions in a cell.
B) They are monomers used to build proteins.
C) They function as chemical catalysts.
D) They increase the rate of chemical reactions.

48) Which one of the following would be correctly classified as a protein? 48) _____
A) cholesterol B) enzymes C) cellulose D) starch

49) Structural proteins 49) _____
A) are found in hair and tendons.
B) include ovalbumin, a protein found in egg white.
C) include receptor molecules.
D) include hemoglobin.

50) A scientist suspects that the food in an ecosystem may have been contaminated with radioactive nitrogen over a period of months. Which of the following substances could be examined for radioactivity to test the hypothesis? 50) _____
A) the hair produced by humans living in the ecosystem
B) the cholesterol in the cell membranes of organisms living in the ecosystem
C) the cell walls of plants growing in the ecosystem
D) the sugars produced during photosynthesis by plants growing in the ecosystem

51) Which of the following characteristics of protein will remain intact if the protein is denatured? 51) _____
A) the number of amino acids in the protein
B) the shape of the protein
C) the binding properties of the protein
D) the function of the protein

52) Proteins cannot be denatured by 52) _____
A) heat.
B) changes in pH.
C) freezing.
D) changes in salt concentration.

53) The primary structure of a protein is 53) _____
A) maintained by hydrogen bonds.
B) the amino acid sequence of the polypeptide chain.
C) composed of two or more polypeptide chains.
D) an α helix or a pleated sheet.

54) Which of the following is an example of secondary structure in a protein? 54) _____
A) an alpha helix
B) a globular shape
C) a particular amino acid sequence
D) the joining of two polypeptide chains

55) The tertiary structure of a polypeptide refers to 55) _____
A) the overall three–dimensional structure.
B) the amino acids of which it is made.
C) the presence of pleated sheets.
D) its size.

56) A protein containing more than one polypeptide chain exhibits the _____ level of protein structure. 56) _____
A) primary B) quaternary C) secondary D) tertiary

57) Mad cow disease serves as an example of how interdependent _____ and _____ are to protein. 57) _____
A) structure . . . function
B) adaptability . . . development
C) form . . . construction
D) solubility . . . texture

58) How are genes used by cells to build proteins? 58) _____
A) The genes in RNA direct the synthesis of a DNA molecule, which is used to build a protein.
B) DNA is transcribed into an amino acid sequence.
C) The genes in RNA direct the synthesis of proteins directly.
D) The genes in DNA direct the synthesis of an RNA molecule, which is used to build a protein.

59) Which of the following statements regarding nucleotides is *false*? 59) _____

A) Nucleotides contain sugar molecules.
B) Nucleotides contain lipids.
C) Nucleotides can be linked together to form nucleic acids.
D) Nucleotides contain nitrogenous bases.

60) Which of the following options correctly pairs a polymer and its monomer? 60) _____

A) RNA, ribose
B) cellulose, amino acids
C) collagen, nucleic acids
D) DNA, nucleotides

61) DNA differs from RNA because DNA 61) _____

A) contains the sugar ribose rather than the sugar deoxyribose.
B) consists of a single rather than a double polynucleotide strand.
C) contains thymine in place of uracil.
D) contains phosphate groups not found in RNA.

62) You work for a company that manufactures food products. A new "wonder food" is being distributed by a rival company. The researchers in your company determine that the "wonder food" contains only carbon, oxygen, and hydrogen. At this point, your researchers can say with certainty that the food 62) _____

A) includes proteins.
B) could only be made of carbohydrates.
C) does not include proteins or nucleic acids.
D) could only be made of triglycerides.

63) In what part of the world did the mutation for lactose tolerance first appear? 63) _____

A) South America
B) North America
C) Eastern Asia
D) Northern Europe

64) Why did the lactose tolerance mutation in the East African herders spread so rapidly within the population? 64) _____

A) Milk provided calcium for strong bones.
B) Lactose was a better source of energy than glucose.
C) Milk was a good source of protein during the winter.
D) It was a selective advantage for survival during droughts.

65) The four most common elements in living organisms are 65) _____

A) C, H, O, Na.
B) C, N, O, Na.
C) C, H, O, N.
D) C, H, O, Fe.

66) Which of the following is a trace element in the human body? 66) _____

A) oxygen
B) zinc
C) hydrogen
D) nitrogen

67) Which of the following statements regarding matter is *false*? 67) _____

A) All matter is composed of elements.
B) All matter has mass.
C) All life is composed of matter.
D) All matter exists in the form of compounds.

68) Which of the following statements best describes a compound? 68) _____

A) A compound is exemplified by sodium.
B) A compound contains two or more different elements in a fixed ratio.
C) A compound is a solution.
D) A compound is a pure element.

69) In the equation $2\ H_2 + O_2 \rightarrow 2\ H_2O$, 69) _____

A) only H_2O is a compound.
B) H_2, O_2, and H_2O are all elements.
C) H_2, O_2, and H_2O are all compounds.
D) only H_2 and O_2 are compounds.

70) Which of the following trace elements needed by humans is commonly added to table salt? 70) _____

A) magnesium B) iron C) fluoride D) iodine

71) In some areas, fluoride is added during the municipal water treatment process in order to help 71) _____

A) prevent the development of mental retardation
B) prevent goiter
C) prevent the growth of bacteria
D) reduce tooth decay

72) Which of the following particles is found in the nucleus of an atom? 72) _____

A) only electrons
B) protons and electrons
C) only protons
D) protons and neutrons

73) Electrons move about the nucleus of an atom in the same way that 73) _____

A) insects fly around a bright lamp at night.
B) birds migrate to a new winter home.
C) boats cross a lake.
D) cars are parked along the sides of a street.

74) What is the atomic mass of an atom that has 6 protons, 6 neutrons, and 6 electrons? 74) _____

A) 18 B) 12 C) 8 D) 6

75) An uncharged atom of boron has an atomic number of 5 and an atomic mass of 11. How many electrons does boron have? 75) _____

A) 2 B) 11 C) 5 D) 15

76) Which of the following is another term used for atomic mass? 76) _____

A) dalton B) darwin C) mendel D) calvin

77) The sodium atom contains 11 electrons, 11 protons, and 12 neutrons. What is the mass number of sodium? 77) _____

A) 23 B) 34 C) 11 D) 22

78) Which of the following best describes the atomic number of an atom? 78) _____

A) the number of protons in the atom
B) the number of neutrons in the atom
C) the number of protons, electrons, and neutrons in the atom
D) the number of electrons in the atom

79) Typically, nitrogen atoms are composed of electrons, protons, and neutrons. An isotope of nitrogen could 79) _____
A) have more neutrons than the usual nitrogen atom.
B) have more protons than the usual nitrogen atom.
C) be negatively charged.
D) be positively charged.

80) A radioactive isotope is an isotope that 80) _____
A) decays.
B) has more protons than the common variant of the element.
C) is stable.
D) has the same atomic mass, but a different atomic number than the common variant of the element.

81) If you found a fossilized dinosaur bone, what method could be used to determine the age of the fossil? 81) _____
A) DNA fingerprinting
B) radial immunodiffusion
C) isotope analysis
D) electrophoresis

82) Which of the following statements about radioactive isotopes is *true*? 82) _____
A) The energy emitted by radioactive isotopes can break chemical bonds and cause molecular damage in cells.
B) The nuclei of radioactive isotopes are unusually stable, but the atoms tend to lose electrons.
C) Radioactive elements are natural and therefore not harmful.
D) When given a choice between radioactive and nonradioactive isotopes of the same atom, living cells are more likely to incorporate the radioactive isotopes into their structures.

83) Radioactive isotopes 83) _____
A) are frequently added to foods as nutritional supplements.
B) are never incorporated into organic compounds.
C) do not occur naturally.
D) can be used in conjunction with PET scans to diagnose diseases.

84) When full, the innermost electron shell of argon contains _____ electrons, and the outermost shell contains _____ electrons. 84) _____
A) 4 . . . 8 B) 2 . . . 8 C) 8 . . . 8 D) 2 . . . 2

85) What happens to an atom if the electrons in the outer shell are altered? 85) _____
A) The atom's characteristics change and it becomes a different element.
B) The atom will disintegrate.
C) The atom becomes radioactive.
D) The properties of the atom will change.

86) A(n) _____ forms when two atoms share electrons. 86) _____
A) ionic bond B) covalent bond C) ion D) hydrogen bond

87) A hydrogen atom has one electron. How many covalent bonds can hydrogen form? 87) _____
A) one covalent bond
B) two covalent bonds
C) no covalent bonds
D) four covalent bonds

88) Table salt is formed when 88) _____
A) sodium and chlorine share electrons to form a bond.
B) a hydrogen bond forms between sodium and chlorine.
C) chlorine gives an electron to sodium.
D) sodium donates its single outer electron to chlorine.

89) The body uses atoms in different ways to accomplish different tasks. For example, one portion of the body's calcium supply strengthens bones, whereas another portion combines with proteins to stimulate blood clotting after tissue injury. Which of the statements that follow provides the most logical chemical explanation of calcium's ability to perform such different functions? 89) _____
A) The calcium in blood has a lighter atomic mass than the calcium in bone and is in a more reactive form.
B) There are many different isotopes of calcium, and the most reactive isotope is found in the bone.
C) The bone contains calcium salts, which are less reactive than the calcium ions found in the blood.
D) The calcium in blood is a more reactive form of the atom and therefore has fewer protons than the calcium in bone.

90) Medicines are often administered in pill form. In many cases, the active ingredient of the pill (the drug) is joined to another substance by _____. This forms a(n) _____, which is stable in the dry environment of a pill bottle but dissociates under the wet conditions of the digestive system to release the drug to the body. 90) _____
A) ionic bonds . . . acid
B) covalent bonds . . . salt
C) hydrogen bonds . . . base
D) ionic bonds . . . salt

91) What is the fundamental difference between covalent and ionic bonding? 91) _____
A) In a covalent bond, the partners share a pair of electrons; in an ionic bond, one partner accepts electrons from the other.
B) Covalent bonds form between atoms of the same element; ionic bonds form between atoms of different elements.
C) Covalent bonding involves only the outermost electron shell; ionic bonding also involves the next electron shell inside the outermost shell.
D) In covalent bonding, both partners end up with filled outer electron shells; in ionic bonding, one partner does and the other does not.

92) Which of the following statements regarding the oxygen atom of a water molecule is *true*? 92) _____
A) Oxygen attracts electrons less strongly than the hydrogen atoms.
B) Oxygen is more positively charged than the hydrogen atoms.
C) Oxygen is more electronegative than the hydrogen atoms.
D) Oxygen is attracted to the negatively charged atoms of other molecules.

93) In a water molecule, hydrogen and oxygen are held together by a(n) _____ bond. 93) _____
A) hydrogen
B) polar covalent
C) nonpolar covalent
D) double covalent

94) A water molecule (H—O—H) is held together by 94) _____
A) a double covalent bond.
B) a single covalent bond.
C) hydrogen bonds.
D) two polar covalent bonds.

95) The hydrogen atoms of a water molecule are bonded to the oxygen atom by _____ bonds, whereas neighboring water molecules are held together by _____ bonds. 95) _____

A) polar covalent . . . ionic
B) polar covalent . . . hydrogen
C) hydrogen . . . polar covalent
D) ionic . . . covalent

96) _____ are weak bonds that are not strong enough to hold atoms together to form molecules but are strong enough to form bonds within and around large molecules. 96) _____

A) Polar covalent bonds
B) Covalent bonds
C) Hydrogen bonds
D) Ionic bonds

97) Water molecules stick to other water molecules because 97) _____

A) water molecules are neutral, and neutral molecules are attracted to each other.
B) the oxygen atoms of adjacent water molecules are attracted to one another.
C) covalent bonds form between the hydrogen atoms of one water molecule and the oxygen atoms of other water molecules.
D) hydrogen bonds form between the hydrogen atoms of one water molecule and the oxygen atoms of other water molecules.

98) Which of the following statements regarding chemical reactions is *false*? 98) _____

A) Chemical reactions involve the making and breaking of chemical bonds.
B) Some chemical reactions create electrons; others destroy them.
C) Although the atoms of a reaction's reactants and products are identical to each other, their molecular formulae differ.
D) The reactants contain the same number of atoms as the products.

99) In the equation $2\ H_2 + O_2 \rightarrow 2\ H_2O$, the H_2 molecules are _____ and the H_2O molecules are _____. 99) _____

A) used . . . stored
B) reactants . . . products
C) created . . . destroyed
D) products . . . reactants

100) Photosynthesis requires many steps to make glucose. As a result of the synthesis process, 100) _____

A) all the carbons from the six carbon dioxide atoms are found in glucose.
B) more atoms are present at the beginning than at the end.
C) water is synthesized by the plant from H_2 and O_2.
D) more carbon dioxide is released from the plant than is absorbed.

101) The tendency of water molecules to stick together is referred to as 101) _____

A) cohesion. B) adhesion. C) polarity. D) transpiration.

102) Water's surface tension and heat storage capacity is accounted for by its 102) _____

A) orbitals.
B) mass.
C) hydrogen bonds.
D) size.

103) The temperature of evaporation is much higher for water than for alcohol. Without knowing more about the chemistry of alcohol, which of the following is the most logical chemical explanation for this phenomenon? 103) _____

A) Alcohol molecules are more cohesive than water molecules. This means that as alcohol molecules evaporate, they pull other alcohol molecules into the air along with them.
B) Ionic bonds form between alcohol molecules. These are the weakest type of bond and are easier to break than the hydrogen bonds between water molecules.
C) Fewer hydrogen bonds form between alcohol molecules. As a result, less heat is needed for alcohol molecules to break away from solution and enter the air.
D) Alcohol has a higher surface tension than water. This means that alcohol molecules can easily break away from other alcohol molecules and evaporate at a lower temperature.

104) As ice melts, 104) _____

A) heat is released.
B) the water becomes less dense.
C) hydrogen bonds are broken.
D) water molecules become less tightly packed.

105) Which of the following statements about water is *false*? 105) _____

A) Water naturally exists in all three physical states on Earth.
B) If ice sank, the oceans would eventually freeze solid.
C) Floating ice on a pond insulates the liquid water below, slowing its rate of freezing.
D) Ice is more dense than liquid water.

106) You've made a hot drink by dissolving a teaspoon of instant coffee and a teaspoon of sugar in a cup of hot water. Which of the following statements is *true*? 106) _____

A) The instant coffee and sugar dissolve because they have no charged regions to repel the partial positive and partial negative regions of the water molecules.
B) The water is the solute portion of the drink.
C) The instant coffee and sugar are solvents.
D) You've just prepared an aqueous solution.

107) Which of the following is dependent on the ability of water molecules to form hydrogen bonds with other molecules besides water? 107) _____

A) the universality of water as a solvent
B) the evaporative cooling of skin surfaces
C) the ability of certain insects to walk on the surface of water
D) the milder temperatures of coastal regions compared to inland areas

108) Clot formation in our blood can lead to a heart attack or stroke. What was altered in the proteins that made the clot? 108) _____

A) The proteins became more polar.
B) The blood was saturated with proteins.
C) The proteins became more soluble in the blood.
D) The proteins were no longer soluble in the blood.

109) A pharmaceutical company hires a chemist to analyze the purity of the water being used in its drug preparations. If the water is pure, the chemist would expect to find 109) _____

A) only molecules of H_2O.
B) only H^+ ions and OH^- ions.
C) H_2O molecules and H^+ ions.
D) H_2O molecules, H^+ ions, and OH^- ions.

110) A solution with a pH of 7 is 110) _____
A) weakly basic. B) weakly acidic. C) neutral. D) strongly acidic.

111) Compared to a solution of pH 3, a solution of pH 1 is 111) _____
A) 10 times more basic. B) 100 times more basic.
C) 100 times more acidic. D) 10 times more acidic.

112) Which of the following statements about pH is *true*? 112) _____
A) Basic pH levels are less than 7.
B) An increase in hydrogen ion concentration means a decrease in pH scale units.
C) A single unit change on the pH scale is equivalent to a 1% change in hydrogen ion concentration.
D) The pH scale is a measure of oxygen ion concentration.

113) Household ammonia has a pH of 12; household bleach has a pH of 13. Which of the following statements about them is *true*? 113) _____
A) A solution that could buffer the bleach and ammonia would remove excess OH^- ions.
B) The ammonia has 10 times as many OH^- ions as the bleach.
C) The ammonia has 10 times as many H^+ ions as the bleach.
D) Both of these substances are strong acids.

114) A buffer 114) _____
A) is an acid that is used to offset overly basic conditions in the body.
B) donates OH^- ions when conditions become too basic and accepts OH^- ions when conditions become too acidic.
C) is a base that is used to offset overly acidic conditions in the body.
D) donates H^+ ions when conditions become too basic and accepts H^+ ions when conditions become too acidic.

115) A diabetic, who does not utilize insulin properly, will metabolize fats instead of glucose. A condition called diabetic ketoacidosis is a common result of excessive fat metabolism, causing blood pH values of 7.1 or less (normal range = 7.35—7.45). What has happened to the blood pH and why? 115) _____
A) The pH is not affected because the blood buffers can absorb the excess H^+.
B) The pH is below normal because buffers can donate OH^+.
C) The pH is above normal (basic) because the ketones are too basic.
D) The pH is below normal (acidic) because the buffering capacity was exceeded.

116) Which of the following statements about acid precipitation is *false*? 116) _____
A) Acid precipitation damages natural wilderness areas.
B) Acid precipitation is defined as having a pH below 5.6.
C) Acid precipitation has little or no effect on soil chemistry.
D) Acid precipitation is primarily the result of burning fossil fuels.

117) The emission of _____ and _____ are primarily responsible for acid precipitation. 117) _____
A) nitrogen oxides . . . sulfur oxides B) carbon dioxide . . . methane
C) carbon dioxide . . . ozone D) halones . . . CFCs

118) Which of the following would be considered an effective way to decrease the production of acid precipitation? 118) _____

A) Whenever possible, walk or ride a bicycle instead of driving a car.
B) Drive more full–size SUVs.
C) Discourage the use of alternative energy resources such as solar, wind, and geothermal energy.
D) Build more coal–generated electricity power plants.

119) Which of the following hypotheses would be supported if liquid water were found on Mars and contained evidence of bacteria–like organisms? 119) _____

A) Life is guided by intelligent design.
B) The chemical evolution of life is possible.
C) Life on Earth must have originated on Mars.
D) Life must evolve in the presence of oxygen.

Answer Key
Testname: LEH REVIEW CHEM AND BIOCHEM

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

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

101) A
102) C
103) C
104) C
105) D
106) D
107) A
108) D
109) D
110) C
111) C
112) B
113) C
114) D
115) D
116) C
117) A
118) A
119) B