

Exam

Name _____

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

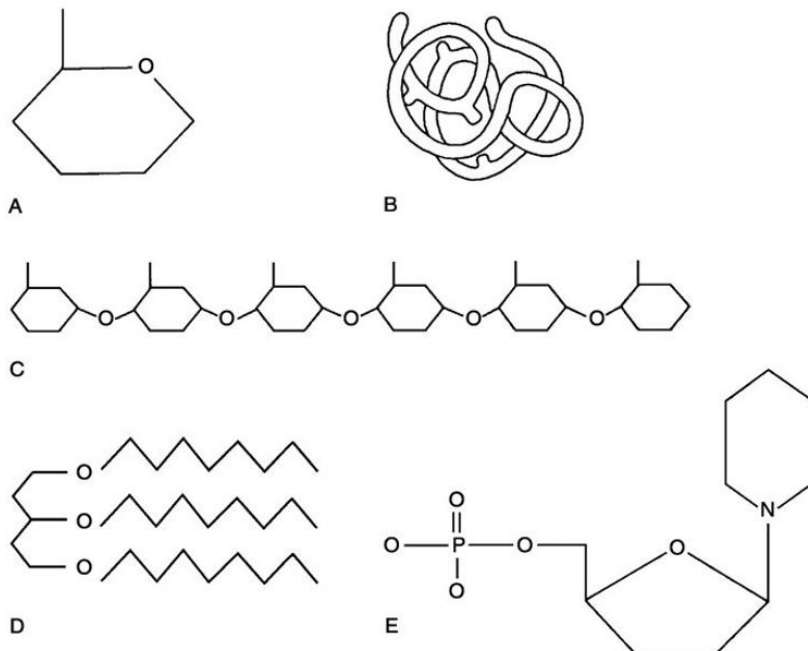


Figure 2.1

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

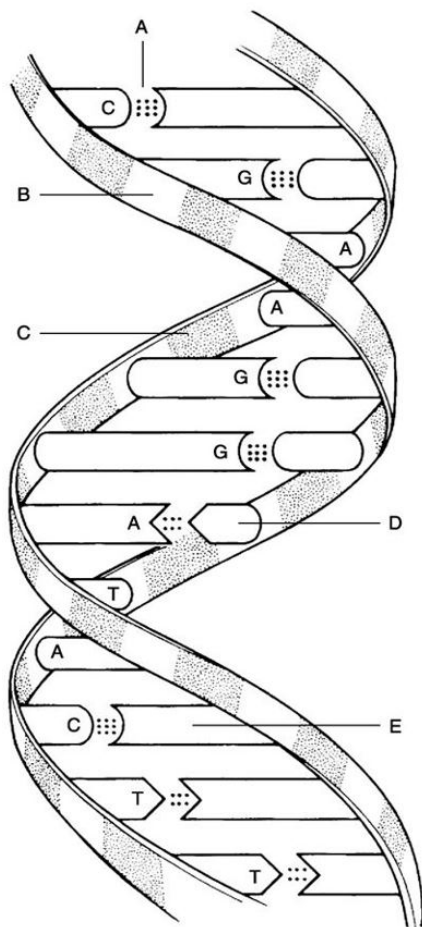


Figure 2.2

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

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: D

A) Nonpolar covalent bond

B) Hydrogen bond

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

Answer: C

C) Ionic bond

D) Polar covalent bond

15) A bond in which electrons are shared equally.

Answer: A

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

Answer: B

Match the following particles to the correct description:

17) Negatively charged subatomic particle.

Answer: D

A) Proton

B) Neutron

18) Neutral subatomic particle.

Answer: B

C) Atom

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

Answer: C

D) Electron

20) Positively charged subatomic particle.

Answer: A

21) Subatomic particle having an AMU (Atomic Mass Unit) of zero.

Answer: D

Match the following:

22) Water.

Answer: A

A) Compound

23) Saline.

Answer: B

B) Solution

24) Dry ice (frozen carbon dioxide).

Answer: A

C) Suspension

25) Blood.

Answer: C

Match the following:

26) Can be measured only by its effects on matter.

Answer: B

A) Matter

B) Energy

27) Anything that occupies space and has mass.

Answer: A

C) Mass

D) Weight

28) 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: C

29) Is a function of, and varies with, gravity.

Answer: D

Match the following:

30) Legs moving the pedals of a bicycle.

Answer: A

A) Mechanical energy

31) When the bonds of ATP are broken, energy is released to do cellular work.

Answer: C

A) Radiant energy

B) Electrical energy

32) Energy that travels in waves. Part of the electromagnetic spectrum.

Answer: A

C) Chemical energy

33) Represented by the flow of charged particles along a conductor, or the flow of ions across a membrane.

Answer: B

Match the following:

34) Protein structure achieved when alpha-helical or beta-pleated regions of the polypeptide chain fold upon one another to produce a compact ball-like, or *globular*, molecule.

Answer: B

A) Secondary

B) Tertiary

C) Quaternary

35) The sequence of amino acids that form the polypeptide chain.

Answer: D

D) Primary

36) Protein structure represented by alpha-helices and beta-sheets.

Answer: A

37) Two or more polypeptide chains, each with its own tertiary structure.

Answer: C

Match the following:

38) Usually, the first one or two letters of an element's name.

Answer: B

A) Atomic number

B) Atomic symbol

39) Number of protons in an atom.

Answer: A

C) Mass number of an element

40) Combined number of protons and neutrons in an atom.

Answer: C

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

- 41) The atomic number of any atom is equal to the number of electrons in its nucleus and is written as a subscript to the left of its atomic symbol.
Answer: True ☒ False
- 42) It is the difference in the R group that makes each amino acid chemically unique.
Answer: ☒ True False
- 43) Chemical properties are determined primarily by neutrons.
Answer: True ☒ False
- 44) A charged particle is generally called an ion or electrolyte.
Answer: ☒ True False
- 45) Isotopes differ from each other only in the number of electrons the atom contains.
Answer: True ☒ False
- 46) About 60% to 80% of the volume of most living cells consists of organic compounds.
Answer: True ☒ False
- 47) Triglycerides are a poor source of stored energy.
Answer: True ☒ False
- 48) Omega-3 fatty acids appear to decrease the risk of heart disease.
Answer: ☒ True False
- 49) Glucose is an example of a monosaccharide.
Answer: ☒ True False
- 50) Glycogen, the storage form of glucose, is primarily stored in skeletal muscle and liver cells.
Answer: ☒ True False
- 51) The lower the pH, the higher the hydrogen ion concentration.
Answer: ☒ True False
- 52) The sharing of electrons in covalent bonds makes them stronger than ionic and hydrogen bonds.
Answer: ☒ True False
- 53) 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.
Answer: ☒ True False
- 54) The fact that no chemical bonding occurs between the components of a mixture is the chief difference between mixtures and compounds.
Answer: ☒ True False
- 55) The acidity of a solution reflects the concentration of free hydrogen ions in the solution.
Answer: ☒ True False

56) A chemical bond is an energy relationship between outer electrons and neighboring atoms.

Answer: ☒ True ☐ False

57) All organic compounds contain carbon except CO₂ and CO.

Answer: ☒ True ☐ False

58) A dipeptide can be broken into two amino acids by dehydration synthesis.

Answer: ☐ True ☒ False

59) The pH of body fluids must remain fairly constant for the body to maintain homeostasis.

Answer: ☒ True ☐ False

60) Mixtures are combinations of elements or compounds that are physically blended together but are not bound by chemical bonds.

Answer: ☒ True ☐ False

61) Buffers resist abrupt and large changes in the pH of body fluids by releasing or binding ions.

Answer: ☒ True ☐ False

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

62) Which of the following elements is necessary for proper conduction of nerve impulses?

- A) P B) Fe C) Na D) I

Answer: C

63) The basic structural material of the body consists of_____.

- A) nucleic acids B) lipids C) carbohydrates D) proteins

Answer: D

64) In general, the lipids that we refer to as oils at room temperature have _____.

- A) long fatty acid chains B) unsaturated fatty acids
C) saturated fatty acids D) a high water content

Answer: B

65) The genetic information is coded in DNA by the_____.

- A) three-dimensional structure of the double helix
B) regular alteration of sugar and phosphate molecules
C) sequence of the nucleotides
D) arrangement of the histones

Answer: C

66) Which of the following does NOT characterize proteins?

- A) They may be denatured or coagulated by heat or acidity.
B) They have both functional and structural roles in the body.
C) Their function depends on their three-dimensional shape.
D) They appear to be the molecular carriers of coded hereditary information.

Answer: D

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

Answer: C

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

Answer: A

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

Answer: A

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

Answer: D

- 71) A chemical reaction in which bonds are created is usually associated with _____.
A) forming a smaller molecule B) the release of energy
C) degradation D) the consumption of energy

Answer: D

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

Answer: C

- 73) 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, 8 B) 2, 8, 1 C) 2, 8 D) 2

Answer: B

- 74) Which of the following statements is FALSE?
A) When the hydrogen ion concentration decreases, the hydroxyl ion concentration also decreases.
B) The more hydrogen ions in a solution, the more acidic the solution.
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: A

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

Answer: B

76) Which of the following would be regarded as an organic molecule?

A) CO₂

B) CH₄

C) H₂O

D) NaOH

Answer: B

77) What is a chain of more than 50 amino acids called?

A) triglyceride

B) nucleic acid

C) polysaccharide

D) protein

Answer: D

78) What structural level is represented by the sequence of amino acids in a polypeptide chain?

A) primary structure

B) secondary structure

C) tertiary structure

D) quaternary structure

Answer: A

79) Carbohydrates and proteins are built up from their basic building blocks by the_____.

A) removal of a carbon atom between each two units

B) removal of a water molecule between each two units

C) addition of a water molecule between each two units

D) addition of a carbon atom between each two units

Answer: B

80) Which statement about enzymes is FALSE?

A) Enzymes may use coenzymes derived from vitamins or cofactors from metallic elements.

B) Enzymes may be damaged by high temperature.

C) Most enzymes can catalyze millions of reactions per minute.

D) Enzymes require contact with substrate in order to assume their active form.

Answer: D

81) Which of the following statements is FALSE?

A) Chemical reactions progress at a faster rate when the reacting particles are present in higher numbers.

B) Catalysts increase the rate of chemical reactions, sometimes while undergoing reversible changes in shape.

C) Larger particles move faster than smaller ones and thus collide more frequently and more forcefully.

D) Chemical reactions proceed more quickly at higher temperatures.

Answer: C

82) Choose the answer that best describes HCO₃⁻.

A) a weak acid

B) a proton donor

C) common in the liver

D) a bicarbonate ion

Answer: D

83) Select which reactions will usually be irreversible regarding chemical equilibrium in human bodies.

A) ADP + Pi to make ATP

B) glucose to CO₂ and H₂O

C) H₂O + CO₂ to make H₂CO₃

D) glucose molecules joined to make glycogen

Answer: B

84) What happens in redox reactions?

- A) the organic substance that loses hydrogen is usually reduced
- B) the reaction is uniformly reversible
- C) both decomposition and electron exchange occur
- D) the electron acceptor is oxidized

Answer: C

85) Which type of proteins can function as chemical messengers or as receptors in the plasma membrane?

- A) enzyme
- B) communication
- C) defensive
- D) transport

Answer: B

86) Which of the following does NOT describe uses for the ATP molecule?

- A) mechanical work
- B) chemical work
- C) transport down their concentration gradient
- D) pigment structure

Answer: D

87) Select the most correct statement regarding nucleic acids.

- A) DNA is a long, double-stranded molecule made up of A, T, G, and C bases.
- B) Three forms exist: DNA, RNA, and tDNA.
- C) RNA is a long, single-stranded molecule made up of the bases A, T, G, and C.
- D) tDNA is considered a "molecular slave" of DNA during protein synthesis.

Answer: A

88) Which of the following is an example of a suspension?

- A) salt water
- B) cytosol
- C) rubbing alcohol
- D) blood

Answer: D

89) If the atomic mass of an element is 14 and the atomic number is 6, which of the following would describe this element?

- A) isotope
- B) atom
- C) neutral
- D) ion

Answer: A

90) The four elements that make up about 96% of body weight are_____.

- A) nitrogen, hydrogen, calcium, sodium
- B) carbon, oxygen, hydrogen, nitrogen
- C) sodium, potassium, hydrogen, oxygen
- D) carbon, oxygen, phosphorus, calcium

Answer: B

91) _____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 K
- C) Vitamin A
- D) Cortisol

Answer: A

92) 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) mixture
- C) solution
- D) colloid

Answer: D