

TOSS-UP

1) BIOLOGY *Multiple Choice* Which of the following trace elements are needed by vertebrae in minute quantities to maintain the health of the thyroid gland and keep it from growing to abnormal size?

- W) Boron
- X) Cobalt
- Y) Iodine
- Z) Fluorine

ANSWER: Y) IODINE

BONUS

1) BIOLOGY *Short Answer* Which element in the human body accounts for the most percentage of the human body's weight?

ANSWER: OXYGEN

TOSS-UP

2) BIOLOGY *Multiple Choice* Which of the following reasons best describes hydrogen bonds?

- W) Intramolecular bonding between one hydrogen atom and one highly electronegative element
- X) Intermolecular bonding between two hydrogen atoms
- Y) Intermolecular bonding between one hydrogen atom and one highly electronegative element
- Z) Intramolecular bonding between two hydrogen atoms

ANSWER: Y) INTERMOLECULAR BONDING BETWEEN ONE HYDROGEN ATOM AND ONE HIGHLY ELECTRONEGATIVE ELEMENT

BONUS

2) BIOLOGY *Short Answer* In the weak bond between a signal molecule triggering a momentary response to the receptor molecule in the human body, what is the name for the structure that permits the passage of the neuron to the receptor molecule?

ANSWER: SYNAPSE

TOSS-UP

3) BIOLOGY *Short Answer* Order the following categories from most general to most specific: Species, Family, Genus, Order, Class

ANSWER: CLASS, ORDER, FAMILY, GENUS, SPECIES (no other order)

BONUS

3) BIOLOGY *Short Answer* In which kingdom are all prokaryotes placed?

ANSWER: MONERA

TOSS-UP

4) BIOLOGY *Multiple Choice* Which of the following acts would not lead to the release of endorphins?

- W) Exercise
- X) Excitement
- Y) Consumption of spicy food
- Z) Consuming heroin

ANSWER: Z) CONSUMING HEROIN

BONUS

4) BIOLOGY *Short Answer* When comparing the molecular structure of an endorphin, and morphine, an opiate drug, which element is in an endorphin that is not in morphine?

ANSWER: SULFUR

TOSS-UP

5) BIOLOGY *Short Answer* What is the name given to the structures within a cell?

ANSWER: ORGANELLE[S]

BONUS

5) BIOLOGY *Short Answer* In eukaryotes, ignoring the first part of cellular respiration, glycolysis, in which organelle do the remaining processes of cellular respiration occur?

ANSWER: MITOCHONDRIA

TOSS-UP

6) BIOLOGY *Short Answer* In photosynthesis, what are the two reactants?

ANSWER: CARBON DIOXIDE AND WATER

BONUS

6) BIOLOGY *Short Answer* In which organelle does photosynthesis take place?

ANSWER: CHLOROPLASTS

TOSS-UP

7) BIOLOGY *Multiple Choice* Which of the following best describes the pH scale?

- W) logarithmic
- X) exponential
- Y) quadratic
- Z) linear

ANSWER: W) LOGARITHMIC

BONUS

7) BIOLOGY *Short Answer* Between which two boundaries must the pH of blood reside in to be considered normal?

ANSWER: 7.35 AND 7.45

TOSS-UP

8) BIOLOGY *Multiple Choice* Which of the following materials is not hydrophilic?

- W) sugar
- X) paper
- Y) wax
- Z) pasta

ANSWER: Y) WAX

BONUS

8) BIOLOGY *Short Answer* Cotton is hydrophilic because it is composed of giant molecules of which compound?

ANSWER: CELLULOSE

TOSS-UP

9) BIOLOGY *Short Answer* In plants, what is the term for the microscopic conduits that transports water upwards through the roots?

ANSWER: XYLEM VESSELS

BONUS

9) BIOLOGY *Short Answer* Hydrogen bonding hold water molecules together. This phenomenon is known as what?

ANSWER: COHESION

TOSS-UP

10) BIOLOGY *Short Answer* Which Swedish chemist first made the distinction between organic compounds from inorganic compounds?

ANSWER: JONS JAKOB BERZELIUS

BONUS

10) BIOLOGY *Short Answer* Which German chemist accidentally isolated urea from mixing solutions of ammonium and cyanate ions?

ANSWER: FRIEDRICH WOHLER

TOSS-UP

11) BIOLOGY *Multiple Choice* Which of these best explains why ice floats?

- W) Hydrogen bonding at freezing point makes it so water molecules are farther apart than water
- X) Hydrogen bonding at freezing point makes it so that water molecules are closer to each other
- Y) Hydrogen bonding at freezing point is nonexistent and therefore, water molecules are farther apart
- Z) Hydrogen bonding in water pushes water molecules farther apart when ice is present

ANSWER: W) HYDROGEN BONDING AT FREEZING POINT MAKES IT SO WATER MOLECULES ARE FARTHER APART THAN WATER

BONUS

11) BIOLOGY *Short Answer* What is the name for substances that minimize changes in the concentrations of hydrogen ions and hydroxide ions?

ANSWER: BUFFERS

TOSS-UP

12) BIOLOGY *Short Answer* What is the name for the view of life beyond physical and chemical laws?

ANSWER: VITALISM

BONUS

12) BIOLOGY *Short Answer* Which graduate student from the University of Chicago used a lab simulation to show that spontaneous creation of organic compounds from inorganic compounds could have been an early stage of life?

ANSWER: STANLEY MILLER

TOSS-UP

13) BIOLOGY *Multiple Choice* What are the bond angles, in degrees, of compounds in which a carbon atom forms single covalent bonds?

- W) 107
- X) 120
- Y) 109.5
- Z) 90

ANSWER: Y) 109.5

BONUS

13) BIOLOGY *Short Answer* What is the simplest hydrocarbon?

ANSWER: METHANE

TOSS-UP

14) BIOLOGY *Multiple Choice* Which of these is not a kind of isomer?

- W) structural
- X) skeletal
- Y) geometric
- Z) enantiomers

ANSWER: X) SKELETAL

BONUS

14) BIOLOGY *Multiple Choice* Which of the following best describes the relationship between butane and isobutane?

- W) They are geometric isomers
- X) They are structural isomers
- Y) They are enantiomers
- Z) They are isotopes

ANSWER: X) THEY ARE STRUCTURAL ISOMERS

TOSS-UP

15) BIOLOGY *Short Answer* What is the name of the drug that is effective against Parkinson's disease, whose enantiomer, D-Dopa, is biologically useless?

ANSWER: L-DOPA

BONUS

15) BIOLOGY *Short Answer* Male and female sex hormones are classified as organic molecules with a carbon skeleton in the form of four interlocking rings. What is the specific name given to organic molecules with this orientation?

ANSWER: STEROIDS

TOSS-UP

16) BIOLOGY *Short Answer* Name the six functional groups considered most vital to life.

ANSWER: HYDROXYL, CARBONYL, CARBOXYL, PHOSPHATE, SULFHYDRYL, AMINO (any order)

BONUS

16) BIOLOGY *Multiple Choice* If a compound is named a thiol, what functional group must it contain?

- W) Sulfhydryl
- X) Hydroxyl
- Y) Carboxyl
- Z) Carbonyl

ANSWER: W) SULFHYDRYL

TOSS-UP

17) BIOLOGY *Multiple Choice* If a compound contains the carbonyl group, it can be identified with which two names?

- W) alcohols or aldehydes
- X) phosphate groups or aldehydes
- Y) alcohols or ketones
- Z) aldehydes or ketones

ANSWER: Z) ALDEHYDES OR KETONES

BONUS

17) BIOLOGY *Short Answer* What is the major component of fossil fuels?

ANSWER: HYDROCARBONS

TOSS-UP

18) BIOLOGY *Short Answer* What is the term used to describe giant molecules of living matter?

ANSWER: MACROMOLECULE

BONUS

18) BIOLOGY *Short Answer* Most macromolecules are large molecules consisting of the same or similar building blocks. What is the name for these?

ANSWER: POLYMERS

TOSS-UP

19) BIOLOGY *Short Answer* What is the other name for carboxylic acids?

ANSWER: ORGANIC ACIDS

BONUS

19) BIOLOGY *Short Answer* What is the simplest carboxylic acid?

ANSWER: FORMIC ACID (accept HCOOH)

TOSS-UP

20) BIOLOGY *Short Answer* Through which kind of reaction are monomers connected together?

ANSWER: CONDENSATION REACTIONS (accept DEHYDRATION REACTIONS)

BONUS

20) BIOLOGY *Short Answer* Through what process are polymers disassembled to monomers?

ANSWER: HYDROLYSIS

TOSS-UP

21) BIOLOGY *Multiple Choice* Which of these amino acids are not polar?

- W) Serine
- X) Cysteine
- Y) Leucine
- Z) Glutamine

ANSWER: Y) LEUCINE

BONUS

21) BIOLOGY *Short Answer* How many amino acids make up the chain of the protein lysozyme?

ANSWER: 129

TOSS-UP

22) BIOLOGY *Multiple Choice* Which of these categories includes incorporates all others given as options?

- W) Carbohydrates
- X) Monosaccharides
- Y) Polysaccharides
- Z) Starch

ANSWER: W) CARBOHYDRATES

BONUS

22) BIOLOGY *Short Answer* What is the simplest kind of carbohydrate?

ANSWER: MONOSACCHARIDES

TOSS-UP

23) BIOLOGY *Multiple Choice* In the storage polysaccharide starch, the glucose monomers are joined by linkages between which two carbons?

- W) 2 to 4
- X) 1 to 4
- Y) 1 to 3
- Z) 2 to 3

ANSWER: X) 1 to 4

BONUS

23) BIOLOGY *Short Answer* Starch is stored as granules in plants within which kinds of cellular structures?

ANSWER: PLASTIDS

TOSS-UP

24) BIOLOGY *Short Answer* : What is the most abundant organic compound on Earth?

ANSWER: CELLULOSE

BONUS

24) BIOLOGY *Short Answer* Cellulose is an example of which kind of structural polysaccharide?

ANSWER: STRUCTURAL POLYSACCHARIDE

TOSS-UP

25) BIOLOGY *Short Answer* A disaccharide is a double sugar consisting of two monosaccharides that are joined by what?

ANSWER: GLYCOSIDIC LINKAGE

BONUS

25) BIOLOGY *Multiple Choice* What is the most common monosaccharide?

- W) Galactose
- X) Ribose
- Y) Glucose
- Z) Xylose

ANSWER: Y) GLUCOSE

TOSS-UP

26) BIOLOGY *Multiple Choice* Which of these is NOT classified as a lipid?

- W) Triacylglycerols
- X) Steroids
- Y) Phospholipids
- Z) Fatty acids

ANSWER: Z) FATTY ACIDS

BONUS

26) BIOLOGY *Short Answer* A fat is composed of three fatty acids joined to glycerol by what kind of bond?

ANSWER: ESTER LINKAGE

TOSS-UP

27) BIOLOGY *Multiple Choice* Amino acids contain which two functional groups?

- W) Amino and carboxyl
- X) Amino and carbonyl
- Y) Amino and phosphate group
- Z) Amino and hydroxyl

ANSWER: W) AMINO AND CARBOXYL

BONUS

27) BIOLOGY *Multiple Choice* Amino acids that make up proteins differ by which bond to the asymmetric carbon?

- W) first
- X) second
- Y) third
- Z) fourth

ANSWER: Z) FOURTH

TOSS-UP

28) BIOLOGY *Short Answer* What is the term given to the event that a protein unravels and loses its original conformation?

ANSWER: DENATURATION

BONUS

28) BIOLOGY *Short Answer* What is the name given to molecules that function as temporary braces in assisting folding of other proteins?

ANSWER: CHAPERONE PROTEINS

TOSS-UP

29) BIOLOGY *Short Answer* What is the name for the family of bases characterized as having a six membered ring consisting of nitrogen and carbon atoms?

ANSWER: PYRIMIDINES

BONUS

29) BIOLOGY *Short Answer* What are the two pyrimidine bases?

ANSWER: THYMINE AND CYTOSINE

TOSS-UP

30) BIOLOGY *Multiple Choice* Which of the following is NOT one of the main kinds of work a cell does?

- W) mechanical work
- X) chemical work
- Y) nuclear work
- Z) transport work

ANSWER: Y) NUCLEAR WORK

BONUS

30) BIOLOGY *Short Answer* What is the main energy source that powers cellular work?

ANSWER: ATP (ADENOSINE TRIPHOSPHATE)