Biol 119 Exam 1 B

Name_____

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

1) _____ is the capacity to do work, the capacity to cause some change in matter.
A) Energy B) Matter C) Molecule D) Atom

2) The validity of a prediction in the scientific method is determined by experimentation or observation.
A) True
B) False

3) Scientific knowledge cannot prove or disprove the existence, or importance to us, of issues that fall outside of the natural world.
A) True
B) False

4) The branch of science that studies living organisms and their life processes is
A) geology B) chemistry C) biology D) physics

5) The total number of protons and neutrons in an atom can best be determined by
A) atomic number
B) the chemical symbol
C) the charge of the atom
D) atomic mass
E) the subscript number following the chemical symbol

6) A solution with a pH of 6 has _____ times as many hydrogen ions as a solution with a pH of 8.
A) 100,000 B) 1,000 C) 100 D) 10 E) 10,000

7) Atoms with either more or fewer neutrons than the usual number for an element are referred to as isotopes.
A) True
B) False

8) Which one of the following best describes the evolutionary advantage of bipedalism?
A) in early humans, allowed for complex motions associated with the use of tools
B) allows an organism to have precise control over the action of the thumb and fingers
C) increases the chance that an organism can communicate through the written word
D) results in improved eye–hand coordination
E) frees the hands for carrying objects

9) A student measuring the pH of the water in a fish tank found it to have a pH of 8. Which one of the following statements is TRUE regarding that solution?
A) The water is alkaline.
B) The water does not contain hydrogen ions.
C) The water is highly acidic.
D) The water is more alkaline than a solution with a pH of 10.
E) The water contains equal numbers of hydrogen ions and hydroxyl ions.

10) Which one of the following is a very important source of energy for nearly all cells?
A) deoxyribose
B) ribose
C) cellulose
D) glucose
E) starch

11) Molecules such as water are referred to as _____ because they are electrically neutral overall but still have partially charged regions.
A) isotopes
B) electrolytes
C) polar molecules
D) covalently charged
E) ions

12) The process by which living organisms maintain a fairly constant internal environment despite changes in the external environment is known as
A) biology
B) chemistry
C) metabolism
D) homeostasis
E) evolution

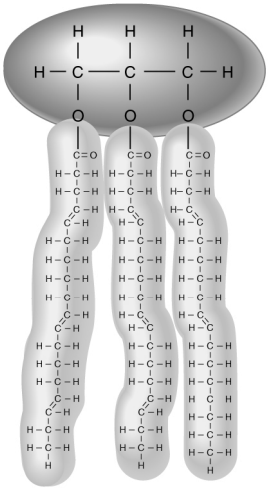
13) How does scientific information in peer–reviewed journals differ from that in newspapers?
A) The article is written by a reporter, not a researcher.
B) Information is less in–depth and easily understood by the average reader.
C) Articles often include political, ethical, and economic ramifications of the scientific findings.
D) Information is not approved by other scientists before its publication.
E) Information is more technical; readers usually require a background in the field in order to understand the article.

14) Special–interest groups are not permitted to post information as science on the Internet unless it has undergone peer review.
A) True
B) False

15) If the number of protons in an atom equals the number of electrons in the atom, the atom is an ion.
A) True
B) False

16) A research student is analyzing the nucleic acid of a virus. He finds that the nucleic acid contains thymine. From this it can be concluded that the nucleic acid
A) is actually a protein
B) contains ribose
C) contains uracil
D) is a strand of DNA
E) contains glucose

17) Which one of the following is TRUE regarding macromolecules?
A) Macromolecules are broken down by hydration synthesis.
B) Cells cannot use macromolecules to signal other cells.
C) Cells produce macromolecules by the process of hydrolysis.
D) Cells use certain macromolecules to store energy.
E) An example of a macromolecule is H_2O.



Triglycerides with unsaturated fatty acids have kinked tails, preventing them from packing closely together.

18) The figure above shows a triglyceride that is liquid at room temperature.
A) True
B) False

19) Chlorine has an atomic number of 17 and an atomic mass of 35. Therefore, chlorine has _____ electrons and _____ neutrons.
A) 35, 17 B) 18, 17 C) 18, 18 D) 17, 18 E) 17, 35

20) Which one of the following statements is TRUE regarding the structure of the atom?
A) Neutrons carry a negative charge.
B) All electrons are located at the same distance from the nucleus.
C) In small elements, such as carbon, electrons have a positive charge; in larger elements, such as barium, electrons have a negative charge.
D) The nucleus is composed of equal numbers of positively charged particles and negatively charged particles.
E) Most of the mass of an atom is due to its protons and neutrons.

21) *Molecules of life* include which one of the following?
A) any noncarbon base molecule
B) proteins, saturated fats, monosaccharides, but not polysaccharides
C) water, proteins, lipids, nucleic acids, carbohydrates
D) lipids and proteins only
E) nonsugar carbohydrates, proteins, lipids, water

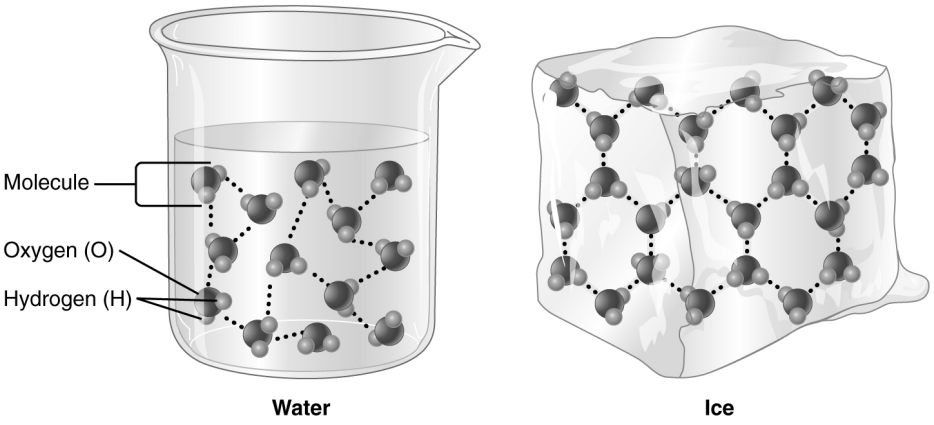
22) Which one of the following is a molecule?
A) Lead B) N C) C D) NaCl E) O

23) Each of the following statements about carbon is TRUE EXCEPT which one?
A) Carbon atoms form diverse molecules that may be linear, branched, or circular.
B) All organic molecules contain carbon.
C) Carbon can form bonds with hydrogen, oxygen, nitrogen, as well as another carbon atom.
D) Carbon atoms form four covalent bonds.
E) Carbon can form strong hydrogen bonds with other elements.

24) Pancreatic cells make insulin, which is a type of protein. These cells use _____ in order to synthesize insulin by the process of _____.
A) fatty acids and glycerol, hydrolysis
B) nucleotides, condensation
C) monosaccharides, dehydration synthesis
D) oligosaccharides, hydrolysis
E) amino acids, dehydration synthesis

25) "Blind" experiments are designed to reduce the possibility that the outcome of an experiment might be affected by the power of suggestion.
A) True
B) False

26) If your blood pH is lowered significantly, many proteins will not be able to fold correctly. The result will be decreased enzyme function throughout the body.
A) True
B) False



27) The type of bond indicated by the dotted lines in the figure above is a hydrogen bond.
A) True
B) False

28) Proteins that function as a catalyst
A) can participate only in reactions that synthesize new products
B) slow down the speed at which chemical reactions occur, but do not alter the final products formed
C) maintain primary structure
D) facilitate chemical reactions by altering the final products formed
E) are referred to as enzymes

29) Which one of the following is needed to synthesize a new strand of DNA?
A) glucose
B) amino acids
C) ribose
D) nucleotides
E) lipids

30) Which one of the following is TRUE regarding water?
A) Electrons are shared equally between the atoms of water.
B) Water is a type of ion.
C) The oxygen side of the water molecule is partially positive.
D) Water molecules are attracted to each other by ionic bonds.
E) Each molecule of water consists of two atoms of hydrogen and one atom of oxygen covalently bonded to each other.

31) Carbohydrates have which one of the following characteristics?
A) They contain carbon, hydrogen, and oxygen in a ratio of 1–2–1.
B) They release energy when their peptide bonds are broken.
C) They are indigestible by most organisms.
D) They are able to store and transmit genetic information.
E) They are composed of carbon, hydrogen, nitrogen, and oxygen.

32) Which one of the following occurs when a phosphate is removed from an ATP molecule?
A) Oxygen produced in the reaction causes the molecule to explode.
B) Energy is released for cell work.
C) Chemical reactions stop in a cell due to lack of an energy source.
D) Energy is added to the ATP molecule to form ADP.
E) Fat is converted to protein.

33) _____ bonds hold the hydrogens to the oxygen within a water molecule, and _____ bonds attract one water molecule to other water molecules.
A) Ionic, covalent
B) Covalent, hydrogen
C) Hydrogen, covalent
D) Ionic, hydrogen
E) Hydrogen, ionic

34) Which one of the following characteristics applies to both living organisms and nonliving things?
A) composed of matter
B) capable of storing energy for later use
C) capable of growth
D) capable of reproduction
E) composed of cells

35) Which one of the following sequences is CORRECT in terms of level of organization from least to most complex?
A) cells, tissues, organs, organ systems, organism
B) tissues, organ systems, population, cells, organism
C) atoms, cells, organism, organ systems, ecosystem
D) atoms, cells, organs, community, population

36) When water is released from a dam, potential energy is converted to chemical energy.
A) True
B) False

37) Which one of the following best describes the proper sequence of steps involved in the scientific method?
a. state hypothesis
b. observe
c. experiment
d. support or disprove hypothesis
e. form a prediction
A) e, b, a, c, d B) a, b, c, e, d C) b, a, e, c, d D) a, b, c, d, e E) b, a, d, e, c

38) Which one of the following forms a bilayer structure that is found in cell membranes?
A) amino acids
B) phospholipids
C) cholesterol
D) triglycerides
E) saturated fats

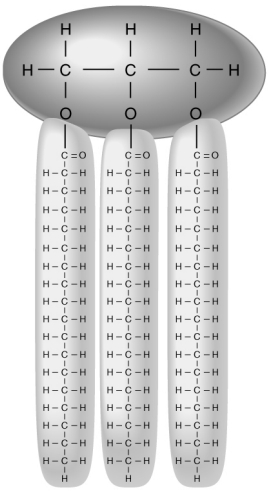
39) A mad scientist has ripped apart an atom and collected all the subatomic particles located in the nucleus of the atom. Which one of the following has he collected?
A) neutrons and electrons
B) electrons and protons
C) protons
D) protons and neutrons
E) electrons

40) Because the natural world includes all energy and matter, it also includes all living organisms.
A) True
B) False

41) Humans possess several characteristics that, when taken together, differentiate them from other organisms. These characteristics include all of the following EXCEPT which one?
A) bipedalism
B) capacity for complex language
C) the inability to maintain a constant internal body temperature
D) opposable thumbs
E) large brain relative to body mass

42) Peer review is essential to the scientific process because
A) the process immediately validates any hypotheses tested in the experiments
B) the process can lead to improvements in articles prior to being published
C) it tests hypotheses proposed by investigators
D) it ensures that the findings from experimentation are modified prior to publication
E) it is the primary means for informing other scientists about new information in the field

43) Electrons are smaller than protons, are negatively charged, and orbit the nucleus.
A) True
B) False



Triglycerides with saturated fatty acids have straight tails, allowing them to pack closely together.

44) The figure above shows a triglyceride that contains unsaturated fatty acids.
A) True
B) False

45) After years of experimentation and testing, it is possible to prove that a hypothesis is true, at which point it becomes absolute truth.
A) True
B) False

46) Alpha helices and beta sheets are characteristic of protein
A) secondary structure
B) quaternary structure
C) enzymatic structure
D) primary structure
E) tertiary structure

47) Which one of the following is a TRUE statement?
A) All living things are made up of at least one cell.
B) Complex organisms can be unicellular.
C) Cells are incapable of maintaining homeostasis because they are too small.
D) Cells arise spontaneously from nonliving chemical elements.
E) Molecules are considered to be the smallest unit capable of exhibiting all the characteristics of life.

48) The mathematics of interpreting and organizing data is known as
A) correlation and causation
B) graphing
C) algebra
D) statistics
E) differential equations

49) Isotopes of an element have the same _____, but different _____.
A) number of neutrons, numbers of protons
B) atomic number, atomic masses
C) name, chemical symbols
D) number of electron shells, numbers of protons
E) atomic mass, atomic numbers

50) The Internet has been used as a rapid means to obtain information, including scientific ideas. Which one of the following statements about the Internet as a source of scientific information is FALSE?
A) Anyone can post "scientific" information, regardless of whether the information is misleading or not true.
B) Information on the Internet is generally very reliable because inaccurate information is quickly removed or corrected.
C) At present, the Internet is less regulated than broadcast and print media.
D) Individuals and/or groups may post information to promote their own personal interests rather than ideas that have been tested through the scientific process.

51) Lipids are important to biological systems because
A) most help to buffer aqueous solutions in the body
B) they are solid at body temperature so they stabilize membranes
C) they are able to store and transmit genetic information
D) all lipids are very soluble in water
E) some lipid types are potentially large sources of energy to perform cellular work

52) A solution has been prepared by mixing glucose in water. Which one of the following statements CORRECTLY describes this solution?
A) Both water and glucose are solutes.
B) Both water and glucose are solvents.
C) Water is the solvent, and glucose is the solute.
D) Water is the solute, and glucose is the solvent.

53) Which one of the following molecules is stored in adipose tissue and serves as an important source of energy for the human body?
A) triglycerides
B) glucose
C) glycogen
D) phospholipids
E) steroids

54) Plants obtain their energy directly from the sun and their raw materials from the soil, air, and water in their environment.
A) True
B) False

Answer Key
Testname: BIOL119 EXAM 1 CHAPTERS 1&2

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

50) B
51) E
52) C
53) A
54) A