Biology of Humans: Concepts, Applications, and Issues, 6e **(Goodenough)**
Chapter 1 Humans in the World of Biology

1.1 Multiple Choice Questions

1) If an object were collected on Mars by the rover Curiosity, it would be considered a living organism if it _____.
A) responded to environmental stimuli
B) had metabolic activities and maintained homeostasis
C) contained DNA and reproduced
D) All of the above are true.
Answer: D
Bloom's Taxonomy: Application/Analysis
Learning Outcome: 1.1
Section: 1.1

2) Which of the following is not a characteristic of all living things?
A) They contain carbohydrates, proteins, lipids, and nucleic acids.
B) They respond to stimuli.
C) They are composed of multiple cells.
D) They have adaptive traits.
Answer: C
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.1
Section: 1.1

3) Which statement is incorrect?
A) Only living things contain nucleic acids, proteins, carbohydrates, and lipids.
B) Only living things are composed of cells.
C) Only living things can grow.
D) Only living things maintain homeostasis.
Answer: C
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.1
Section: 1.1

4) You are classifying an organism and trying to determine to which domain it belongs. The organism is unicellular and was isolated from a very unusual environment. This organism probably belongs in which domain?
A) Eukarya
B) Archaea
C) Bacteria
D) None of the domains above is correct.
Answer: B
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.2
Section: 1.2

5) A scientist discovers an unidentified organism that is composed of multiple cells and has a membrane-bound nucleus. Of the choices listed, the most likely classification would be _____.
A) Archaea
B) Bacteria
C) fungi
D) Any of the above could be correct.
Answer: C
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.2
Section: 1.2

6) Members of the domains Bacteria and Archaea are called _____ because they lack a nucleus and internal compartments.
A) eukaryotes
B) molds
C) protists
D) prokaryotes
Answer: D
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.2
Section: 1.2

7) Which of the following types of organisms are not composed of eukaryotic cells?
A) fungi
B) bacteria
C) plants
D) animals
E) protists
Answer: B
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.2
Section: 1.2

8) Cells that possess a nucleus and a membrane system that establishes internal compartments belong in which of the following groups?
A) eukaryotes
B) viruses
C) Archaea
D) Bacteria
Answer: A
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.2
Section: 1.2

9) Humans belong to which of the following domains?
A) Bacteria
B) Archaea
C) Eukarya
D) vertebrates
Answer: C
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.2
Section: 1.2

10) Which of the following levels of organization would a single-celled organism be <u>excluded</u> from?
A) cellular
B) molecular
C) tissue
D) population
Answer: C
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.3
Section: 1.3

11) How does a population differ from an ecosystem?
A) A population consists of all living organisms in the area, whereas an ecosystem consists of all living and nonliving aspects of an area.
B) A population consists of all living organisms in an area, whereas an ecosystem consists of only one species.
C) An ecosystem includes a community, whereas a population does not.
D) An ecosystem and a population are identical; they are two terms for the same concept.
Answer: C
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.3
Section: 1.3

12) Living organisms are members of all of the levels listed; however, rocks are components of _____.
A) the community
B) an organism
C) the population
D) the ecosystem
Answer: D
Bloom's Taxonomy: Application/Analysis
Learning Outcome: 1.3
Section: 1.3

13) A statement such as "If human body temperature increases to a certain level, then critical proteins will be denatured" would most likely be associated with _____.
A) inductive reasoning
B) deductive reasoning
C) a hypothesis
D) a conclusion
Answer: B
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.4
Section: 1.4

14) "An athlete who uses dietary supplements will perform better than one who doesn't." This statement would be an example of which of the following?
A) inductive reasoning
B) hypothesis
C) theory
D) clinical trial
Answer: B
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.4
Global LO: G1
Section: 1.4

15) Researchers testing new drugs usually give the drug to one group of people and give placebos, "sugar pills," to another group. The group receiving the placebo _____.
A) is needed so that the test will be repeated enough times
B) is the control group
C) constitutes the experimental group
D) is a backup in case some of the people getting the drug drop out of the test
Answer: B
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.4
Global LO: G1
Section: 1.4

16) Which process used to solve problems in science involves accumulating facts through observation until the evidence leads to a general statement about nature?
A) deductive reasoning
B) hypothesis
C) inductive reasoning
D) theory
Answer: C
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.4
Global LO: G1
Section: 1.4

17) In a double-blind experiment, _____.
A) participants are randomly assigned to a control or experimental group
B) the participants are unaware of whether they are in the experimental or control groups because of the use of placebos
C) the researchers are unaware of which participants are in the experimental and control groups
D) All of the above are true.
Answer: D
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.4
Global LO: G1
Section: 1.4

18) The term _____ variable refers to one of two variables involved in an experiment, in which neither variable can be isolated as having an effect.
A) blind
B) statistical
C) multiple
D) confounding
Answer: D
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.4
Global LO: G1
Section: 1.4

19) During phase I clinical trials, a new drug is tested _____.
A) in an animal model
B) on fewer than 100 human volunteers
C) on a few hundred human volunteers
D) on thousands of human volunteers
Answer: B
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.4
Section: 1.4

20) A study shows that people who eat fish three times a week live longer. Based on this study, which of the following can you not conclude?
A) There is a correlation between eating fish in the diet and the length of life.
B) Fish is a healthy choice of food.
C) Eating fish causes longer life.
D) All of the above can be concluded based on this study.
Answer: C
Bloom's Taxonomy: Application/Analysis
Learning Outcome: 1.5
Global LO: G3
Section: 1.5

21) Information literacy involves the ability to _____.
A) recognize what you need to know
B) locate relevant information
C) evaluate and apply information to a problem
D) All of the above are correct.
Answer: D
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.5
Global LO: G6
Section: 1.5

1.2 Fill-in-the-Blank Questions

1) _____ is the ability to maintain a relatively constant internal environment.
Answer: Homeostasis
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.1
Section: 1.1

2) Traits that enable an organism to survive and reproduce in its natural environment are called _____.
Answer: adaptive traits
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.1
Section: 1.1

3) The domain Eukarya has _____ kingdoms.
Answer: four
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.2
Section: 1.2

4) A community and its physical environment are often referred to as a(n) _____.
Answer: ecosystem
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.3
Section: 1.3

5) A(n) _____ is all of the species in an ecosystem that can interact in a geographic area.
Answer: community
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.3
Section: 1.3

6) All individuals of a species that can interbreed in an area are called a(n) _____.
Answer: population
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.3
Section: 1.3

7) A(n) _____ is a group of similar cells that perform the same function.
Answer: tissue
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.3
Section: 1.3

8) The smallest functional unit of life is known as a(n) _____.
Answer: cell
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.3
Section: 1.3

9) A(n) _____ group is treated like an experimental group, except for the one variable being tested.
Answer: control
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.4
Global LO: G1
Section: 1.4

10) An educated guess or a testable statement used to answer a question about observations is referred to as a(n) _____.
Answer: hypothesis
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.4
Global LO: G1
Section: 1.4

11) _____ reasoning involves gathering facts that lead toward a logical generalized statement or conclusion.
Answer: Inductive
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.4
Global LO: G2
Section: 1.4

12) A(n) _____ is a substance that appears to be identical to a drug being tested but has no known effect on the condition being studied.
Answer: placebo
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.4
Global LO: G5
Section: 1.4

13) A(n) _____ involves drug testing on humans.
Answer: clinical trial
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.4
Global LO: G5
Section: 1.4

14) When making scientific decisions in one's life, it is best to ask questions, gather and evaluate information and evidence, and carefully consider the sources of the material. This process is called _____.
Answer: critical thinking
Bloom's Taxonomy: Application/Analysis
Learning Outcome: 1.5
Global LO: G2
Section: 1.5

1.3 Matching Questions

Match each definition in the first column to the correct term in the second column.

A) Ecosystem
B) Informed consent agreement
C) Epidemiologic studies
D) Critical thinking
E) Homeostasis
F) Metabolism
G) Placebo
H) Theory
I) Hypothesis
J) Adaptive trait

1) A nondrug substance made to look like a real drug.
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.4
Section: 1.4

2) The collection of all chemical reactions that occur in a cell.
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.1
Section: 1.1

3) A testable explanation for an observation.
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.4
Global LO: G1
Section: 1.4

4) A well-supported explanation for a particular scientific phenomenon.
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.4
Global LO: G1
Section: 1.4

5) A document that lists all potential negative effects of participation in a study.
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.4
Global LO: G5
Section: 1.4

6) These examine patterns within populations to find a correlation between a variable and its suspected effects.
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.4
Section: 1.4

7) The process of evaluating evidence and its source carefully before drawing conclusions.
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.5
Global LO: G2
Section: 1.5

8) Specific areas in which certain living organisms interact with their environment.
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.2
Section: 1.2

9) The ability to maintain a relatively constant internal environment.
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.1
Section: 1.1

10) A genetic trait that helps an organism survive and reproduce in its environment.
Bloom's Taxonomy: Knowledge/Comprehension
Learning Outcome: 1.1
Section: 1.1

Answers: 1) G 2) F 3) I 4) H 5) B 6) C 7) D 8) A 9) E 10) J

1.4 Short Answer and Essay Questions

1) A particular virus consists of only DNA and proteins. Viruses attach to the surface of a host cell and inject the viral DNA into the host. The host cell then copies the viral DNA and makes new viruses. Eventually, the host cell is killed, and the new viruses are released. These new viruses search for new hosts to continue the cycle. Identify and apply at least three characteristics of life to justify whether a virus is a living thing.
Answer: Whether a virus is a living thing is debatable. Students may argue that a virus is not alive because it does not reproduce on its own, it is not made of cells, etc. However, a student may argue in the other direction based on his or her interpretation of the characteristics of life. For example, the student might answer that viruses do reproduce by coercing their host cells into copying their contents.
Bloom's Taxonomy: Synthesis/Evaluation
Learning Outcome: 1.1
Global LO: G8
Section: 1.1

2) List and briefly explain the organization of life, beginning at the molecular level and continuing through the biosphere.

Answer: Molecules exist in the cell, which is the basic unit of life, and cells can be arranged to form tissues, which in turn can form organs. Organs can be arranged into organ systems that carry out a particular physiological function. Cells, tissues, organs, and organ systems make up an individual organism. A group of individuals of the same species in a given area form a population. Many populations in an ecosystem make up a community, and all living organisms and abiotic factors that support life on Earth form the biosphere.

Bloom's Taxonomy: Application/Analysis
Learning Outcome: 1.3
Global LO: G8
Section: 1.3

3) Explain how the destruction of the original tropical forests will affect the development of new medicines.

Answer: More than 25% of the prescription medicines in the United States contain chemicals that came from medically important plants. Important medicines, such as aspirin and digitalis, were discovered in plants that had been used as folk remedies. The majority of plant species are in tropical forests. Deforestation will result in the loss of many plant species, and humanity will have no way of knowing what potential new medicines are being destroyed.

Bloom's Taxonomy: Application/Analysis
Learning Outcome: 1.4
Global LO: G2|G5|G8
Section: 1.4

4) How can you test the following statement using the scientific methodology? "Exam performance improves as the amount of sleep obtained the night before an exam increases."

Answer: The students should formulate a hypothesis, design an experiment that tests their hypothesis, have a control group, explain how they will collect data, and explain how they will analyze their data.

Bloom's Taxonomy: Synthesis/Evaluation
Learning Outcome: 1.4
Global LO: G1|G3|G4
Section: 1.4

5) It is notoriously difficult to perform unbiased studies when human subjects are used. When governmental agencies such as the U.S. Food and Drug Administration (FDA) are trying to determine the validity of scientific claims, they very closely examine the methods used in the experiments. What are the three phases of clinical trial, and which one(s) must a drug pass in order to be sold in U.S. markets?
Answer: Phase I tests whether the drug is safe for humans, determines the effective dosage range, and identifies side effects. Phase II tests whether the drug works for its intended purpose. Phase III tests how the drug compares to already existing, available treatments. A drug needs to pass all three phases to be approved by the FDA.
Bloom's Taxonomy: Application/Analysis
Learning Outcome: 1.4
Global LO: G1|G5
Section: 1.4

6) Lately, many claims concerning the health benefits of green tea have appeared in the news. Suppose you read a claim that says drinking green tea causes weight loss. The information provided states that participants were weighed at the beginning of the study, were then asked to drink 2 cups of green tea every day for 6 weeks, and finally were weighed at the end of the study. Participants who drank the tea for 6 weeks seemed to have lost some weight by the end of the study, so the researchers concluded that green tea is helpful for weight loss. This study has some obvious holes in it. Explain three things that could be done to improve the design of this study. Do not assume any information other that what has been provided.
Answer: The student can suggest that a control group be used and/or that placebos be used. Also, the study could be double-blind.
Bloom's Taxonomy: Synthesis/Evaluation
Learning Outcome: 1.4
Global LO: G1|G2|G8
Section: 1.4