

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

- 1) If an object were collected on Mars by the rover Curiosity, it would be considered a living organism if it _____. 1) _____
A) had metabolic activities and maintained homeostasis
B) responded to environmental stimuli
C) contained DNA and reproduced
D) All of the above are true.
- 2) Which of the following is not a characteristic of all living things? 2) _____
A) They contain carbohydrates, proteins, lipids, and nucleic acids.
B) They have adaptive traits.
C) They are composed of multiple cells.
D) They respond to stimuli.
- 3) 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? 3) _____
A) Bacteria
B) Eukarya
C) Archaea
D) None of the domains above is correct.
- 4) 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 _____. 4) _____
A) fungi
B) Archaea
C) Bacteria
D) Any of the above could be correct.
- 5) Members of the domains Bacteria and Archaea are called _____ because they lack a nucleus and internal compartments. 5) _____
A) molds
B) protists
C) eukaryotes
D) prokaryotes
- 6) Which of the following types of organisms are not composed of eukaryotic cells? 6) _____
A) protists
B) plants
C) fungi
D) animals
E) bacteria
- 7) Cells that possess a nucleus and a membrane system that establishes internal compartments belong in which of the following groups? 7) _____
A) viruses
B) Archaea
C) eukaryotes
D) Bacteria
- 8) Which of the following levels of organization would a single-celled organism be excluded from? 8) _____
A) tissue
B) cellular
C) population
D) molecular
- 9) How does a population differ from an ecosystem? 9) _____
A) A population consists of all living organisms in an area, whereas an ecosystem consists of only one species.
B) An ecosystem includes a community, whereas a population does not.
C) A population consists of all living organisms in the area, whereas an ecosystem consists of all living and nonliving aspects of an area.
D) An ecosystem and a population are identical; they are two terms for the same concept.

- 10) Living organisms are members of all of the levels listed; however, rocks are components of _____ 10) _____
 A) the population B) the ecosystem C) an organism D) the community
- 11) Humans belong to which of the following domains? 11) _____
 A) Eukarya B) vertebrates C) Bacteria D) Archaea
- 12) Which statement is incorrect? 12) _____
 A) Only living things are composed of cells.
 B) Only living things can grow.
 C) Only living things maintain homeostasis.
 D) Only living things contain nucleic acids, proteins, carbohydrates, and lipids.
- 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 _____. 13) _____
 A) inductive reasoning B) a conclusion
 C) a hypothesis D) deductive reasoning
- 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? 14) _____
 A) hypothesis B) theory
 C) inductive reasoning D) clinical trial
- 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 _____. 15) _____
 A) constitutes the experimental group
 B) is a backup in case some of the people getting the drug drop out of the test
 C) is the control group
 D) is needed so that the test will be repeated enough times
- 16) Which process used to solve problems in science involves accumulating facts through observation until the evidence leads to a general statement about nature? 16) _____
 A) hypothesis B) inductive reasoning
 C) theory D) deductive reasoning
- 17) In a double-blind experiment, _____. 17) _____
 A) participants are randomly assigned to a control or experimental group
 B) All of the above are true.
 C) the researchers are unaware of which participants are in the experimental and control groups
 D) the participants are unaware of whether they are in the experimental or control groups because of the use of placebos
- 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. 18) _____
 A) blind B) statistical C) confounding D) multiple
- 19) During phase I clinical trials, a new drug is tested _____. 19) _____
 A) on thousands of human volunteers B) on fewer than 100 human volunteers
 C) on a few hundred human volunteers D) in an animal model

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? 20) _____
A) Eating fish causes longer life.
B) Fish is a healthy choice of food.
C) There is a correlation between eating fish in the diet and the length of life.
D) All of the above can be concluded based on this study.

21) Information literacy involves the ability to _____. 21) _____
A) evaluate and apply information to a problem
B) recognize what you need to know
C) locate relevant information
D) All of the above are correct.

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

22) A(n) _____ group is treated like an experimental group, except for the one variable being tested. 22) _____

23) An educated guess or a testable statement used to answer a question about observations is referred to as a(n) _____. 23) _____

24) Traits that enable an organism to survive and reproduce in its natural environment are called _____. 24) _____

25) _____ reasoning involves gathering facts that lead toward a logical generalized statement or conclusion. 25) _____

26) A community and its physical environment are often referred to as a(n) _____. 26) _____

27) A(n) _____ is all of the species in an ecosystem that can interact in a geographic area. 27) _____

28) All individuals of a species that can interbreed in an area are called a(n) _____. 28) _____

29) A(n) _____ is a group of similar cells that perform the same function. 29) _____

30) 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. 30) _____

31) _____ is the ability to maintain a relatively constant internal environment. 31) _____

32) A(n) _____ involves drug testing on humans. 32) _____

33) The smallest functional unit of life is known as a(n) _____. 33) _____

34) The domain Eukarya has _____ kingdoms. 34) _____

MATCHING. Choose the item in column 2 that best matches each item in column 1.

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

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|---|-------------------------------|-----------|
| 35) A nondrug substance made to look like a real drug. | A) Metabolism | 35) _____ |
| | B) Placebo | |
| 36) The collection of all chemical reactions that occur in a cell. | C) Hypothesis | 36) _____ |
| | D) Informed consent agreement | |
| 37) A testable explanation for an observation. | E) Critical thinking | 37) _____ |
| | F) Ecosystem | |
| 38) A well-supported explanation for a particular scientific phenomenon. | G) Theory | 38) _____ |
| | H) Adaptive trait | |
| 39) A document that lists all potential negative effects of participation in a study. | I) Epidemiologic studies | 39) _____ |
| | J) Homeostasis | |
| 40) These examine patterns within populations to find a correlation between a variable and its suspected effects. | | 40) _____ |
| | | |
| 41) The process of evaluating evidence and its source carefully before drawing conclusions. | | 41) _____ |
| | | |
| 42) Specific areas in which certain living organisms interact with their environment. | | 42) _____ |
| | | |
| 43) The ability to maintain a relatively constant internal environment. | | 43) _____ |
| | | |
| 44) A genetic trait that helps an organism survive and reproduce in its environment. | | 44) _____ |

ESSAY. Write your answer in the space provided or on a separate sheet of paper.

- 45) Explain how the destruction of the original tropical forests will affect the development of new medicines.
- 46) List and briefly explain the organization of life, beginning at the molecular level and continuing through the biosphere.
- 47) 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."

- 48) 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.
- 49) 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?
- 50) 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 than what has been provided.

Answer Key

Testname: UNTITLED1

- 1) D
- 2) C
- 3) C
- 4) A
- 5) D
- 6) E
- 7) C
- 8) A
- 9) B
- 10) B
- 11) A
- 12) B
- 13) D
- 14) A
- 15) C
- 16) B
- 17) B
- 18) C
- 19) B
- 20) A
- 21) D
- 22) control
- 23) hypothesis
- 24) adaptive traits
- 25) Inductive
- 26) ecosystem
- 27) community
- 28) population
- 29) tissue
- 30) placebo
- 31) Homeostasis
- 32) clinical trial
- 33) cell
- 34) four
- 35) B
- 36) A
- 37) C
- 38) G
- 39) D
- 40) I
- 41) E
- 42) F
- 43) J
- 44) H
- 45) 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.

Answer Key

Testname: UNTITLED1

- 46) 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.
- 47) 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.
- 48) 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.
- 49) 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.
- 50) The student can suggest that a control group be used and/or that placebos be used. Also, the study could be double blind.