Student name:\_\_\_\_\_\_\_\_\_\_

**1)** Thinking about life's organizationalhierarchy in a biological system, which of the following is the correct sequence from the smallest unit to the largest unit?

 A) atom - molecule -organelle - cell - tissue
 B) molecule - atom -organelle - tissue - cell
 C) cell - organelle -atom - tissue - molecule
 D) organelle -molecule - atom - tissue - cell
 E) atom - organelle -molecule - cell - tissue

 **Question Details**Bloom's : 1. Remember
Learning Outcome : 01.01.02 Give examples of each level of biological organization.
Section : 01.01
Topic : Levels of Biological Organization
Accessibility : Keyboard Navigation
Gradable : automatic

**2)** The hierarchy of life extends past individual organisms. Which of the following is the correct sequence,from least inclusive to most inclusive, following an individual organism?

 A) population -ecosystem - community - biosphere
 B) community -population - ecosystem - biosphere
 C) community -population - biosphere - ecosystem
 D) population -community - ecosystem - biosphere
 E) ecosystem -population - biosphere - community

 **Question Details**Bloom's : 1. Remember
Learning Outcome : 01.01.02 Give examples of each level of biological organization.
Section : 01.01
Topic : Levels of Biological Organization
Accessibility : Keyboard Navigation
Gradable : automatic

**3)** In living organisms, emergent properties

 A) are functions that arise from interactions between a system's components.
 B) evolve new properties from other similar organisms.
 C) are produced in a new generation of offspring that will show the properties.
 D) are qualities of cells that disappear when in the presence of other cells.
 E) functionally arise from larger successful parts working together for a stronger organism.

 **Question Details**Section : 01.01
Topic : Levels of Biological Organization
Accessibility : Keyboard Navigation
Gradable : automatic
Bloom's : 2. Understand
Learning Outcome : 01.01.01 Describe the characteristics that all living organisms share.
Topic : Characteristics of Life

**4)** To be considered living, an organism must minimally consist of

 A) DNA andproteins.
 B) one or morecells.
 C) RNA andproteins.
 D) atoms andmolecules.
 E) DNA and RNA.

 **Question Details**Bloom's : 1. Remember
Section : 01.01
Accessibility : Keyboard Navigation
Gradable : automatic
Learning Outcome : 01.01.01 Describe the characteristics that all living organisms share.
Topic : Characteristics of Life

**5)** Which of these is not a required characteristic of life?

 A) homeostasis
 B) movement
 C) structuralorganization
 D) evolution
 E) energy use

 **Question Details**Bloom's : 1. Remember
Section : 01.01
Accessibility : Keyboard Navigation
Gradable : automatic
Learning Outcome : 01.01.01 Describe the characteristics that all living organisms share.
Topic : Characteristics of Life

**6)** Organisms that make their own food by capturing energy from nonliving resources (solar energy) are called

 A) decomposers.
 B) parasites.
 C) primary producers.
 D) consumers.
 E) detritivores.

 **Question Details**Bloom's : 1. Remember
Section : 01.01
Accessibility : Keyboard Navigation
Gradable : automatic
Learning Outcome : 01.01.01 Describe the characteristics that all living organisms share.
Topic : Characteristics of Life

**7)** Organisms that obtain energy and nutrients by eating either living or dead organisms are called

 A) primary producers.
 B) plants.
 C) consumers.
 D) autotrophs.
 E) All of the answer choices are correct.

 **Question Details**Bloom's : 1. Remember
Learning Outcome : 01.01.02 Give examples of each level of biological organization.
Section : 01.01
Accessibility : Keyboard Navigation
Gradable : automatic
Topic : Characteristics of Life

**8)** Which of the following is an example of a characteristic of life?

 A) Energy is needed to build, regulate, and conduct processes of life.
 B) Organisms are composed of atoms that make up cells.
 C) Organisms have the ability to reproduce, grow, and develop.
 D) Organisms maintain internal constancy.
 E) All of the answer choices are correct.

 **Question Details**Section : 01.01
Accessibility : Keyboard Navigation
Gradable : automatic
Bloom's : 2. Understand
Learning Outcome : 01.01.01 Describe the characteristics that all living organisms share.
Topic : Characteristics of Life

**9)** The basic unit of classification in the taxonomic hierarchy, designating the organism "type," is the

 A) species.
 B) domain.
 C) genus.
 D) family.
 E) kingdom.

 **Question Details**Bloom's : 1. Remember
Topic : Levels of Biological Organization
Accessibility : Keyboard Navigation
Gradable : automatic
Learning Outcome : 01.02.01 Compare and contrast the three branches of life.
Section : 01.02

**10)** The four kingdoms included in the domain Eukarya are

 A) Bacteria, Fungi, Archaea, and Animalia.
 B) Bacteria, Protista, Plantae, and Animalia.
 C) Protista, Fungi,Plantae, and Animalia.
 D) Archaea, Bacteria, Protista, and Animalia.
 E) Archaea, Fungi,Plantae, and Animalia.

 **Question Details**Bloom's : 1. Remember
Topic : Levels of Biological Organization
Accessibility : Keyboard Navigation
Gradable : automatic
Learning Outcome : 01.02.01 Compare and contrast the three branches of life.
Section : 01.02

**11)** A major difference between prokaryotes and eukaryotes is that whereas prokaryotes

 A) have cell walls, eukaryotes do not.
 B) do not have a nucleus, eukaryotes have a nucleus in their cells.
 C) have DNA, eukaryotes only have RNA.
 D) have chloropasts for photosynthesis, eukaryotes do not.
 E) have mitochondria, eukaryotes do not.

 **Question Details**Bloom's : 1. Remember
Section : 01.01
Accessibility : Keyboard Navigation
Gradable : automatic
Topic : Characteristics of Life
Learning Outcome : 01.02.01 Compare and contrast the three branches of life.
Section : 01.02
Topic : Cell Theory

**12)** Until the late 1970s, there was no "Domain" as the broadest category in taxonomy. Instead, there were five kingdoms: Protista, Plantae, Fungi, Animalia, and Monera, which included all bacteria-like organisms. Researchers proposed the domains to distinguish between the bacteria-like organisms. Which information supported placing bacteria and archaea in separate domains?

 A) Differences in DNA among the existing kingdoms showed a need for a broader naming category.
 B) More complex emergent properties developed after organisms were originally categorized into kingdoms.
 C) Cell shapes of bacteria and archaea were found to be more distinct, after microscope technology improved.
 D) Evolution led tonew adaptations and diversity of organisms.
 E) Organisms in the Bacteria and Archaea domains have a nucleus, whereas eukaryotes do not.

 **Question Details**Section : 01.01
Topic : Levels of Biological Organization
Accessibility : Keyboard Navigation
Gradable : automatic
Topic : Characteristics of Life
Learning Outcome : 01.02.01 Compare and contrast the three branches of life.
Section : 01.02
Bloom's : 4. Analyze
Section : 01.03

**13)** Which of the following is not a true statement about the scientific method?

 A) It is a generalway of organizing an investigation.
 B) It requires testing a hypothesis.
 C) It begins withobservations.
 D) It does not applyto problems encountered in everyday life.
 E) It is a frameworkto consider evidence in a repeatable way.

 **Question Details**Accessibility : Keyboard Navigation
Gradable : automatic
Bloom's : 2. Understand
Section : 01.03
Learning Outcome : 01.03.01 Apply the scientific method to design experiments and analyze data.
Topic : Scientific Method

**14)** Which of the following is not true about a hypothesis?

 A) It can be provento be true.
 B) It can be rejected.
 C) It is a tentativeexplanation.
 D) Previous knowledgecan help support it.
 E) It must betestable to be useful.

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Gradable : automatic
Section : 01.03
Learning Outcome : 01.03.01 Apply the scientific method to design experiments and analyze data.
Topic : Scientific Method

**15)** In an experimental procedure, the researcher has established multiple levels of a chemical, or amounts of light, or some other factor at the beginning of the experiment, in order to determine if and how much the biological system responds. The manipulated factor at varying levels is the

 A) standardized variable.
 B) control group.
 C) dependent variable.
 D) independent variable.
 E) Both control groupand standardized variable are correct.

 **Question Details**Accessibility : Keyboard Navigation
Gradable : automatic
Section : 01.03
Topic : Scientific Method
Bloom's : 3. Apply
Learning Outcome : 01.03.02 Identify the variables in an experiment.

**16)** Examine this diagram. Note the structure of branches connecting groups of organisms. Called a phylogenetic tree, the branches propose relationships among organisms to each other, related to common ancestors. Although the proposed relationships can be described in sentences, the diagram summarizes them visually. Which of the following statements is true based on this diagram?


 A) The organisms in domain Archaea are more closely related to the organisms in domain Eukarya than those in domain Bacteria.
 B) All the organisms in this phylogenetic tree are equally related to one another.
 C) The organisms in domain Bacteria are more closely related to the organisms in domain Eukarya than those in domain Archaea.
 D) The organisms in kingdom Protista are part of domain Bacteria.
 E) All of the answer choices are correct.

 **Question Details**Accessibility : Keyboard Navigation
Gradable : automatic
Bloom's : 2. Understand
Learning Outcome : 01.02.01 Compare and contrast the three branches of life.
Section : 01.02
Section : 01.03
Topic : Scientific Method
Learning Outcome : 01.03.03 Differentiate between hypotheses, theories, and facts.

**17)** In an experimental procedure, the researcher measures changes, such as cell growth rates, numbers of patients with a disease, etc. in response to factors manipulated at the beginning of the experiment. This measure of change in response to the initial conditions is the

 A) independent variable.
 B) dependent variable.
 C) control group.
 D) standardized variable.
 E) Both dependent variable and standardized variable are correct.

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Gradable : automatic
Section : 01.03
Topic : Scientific Method
Learning Outcome : 01.03.02 Identify the variables in an experiment.

**18)** Which of the following would not be a "control" in an experimental procedure?

 A) a placebogroup
 B) a known standardof comparison
 C) a normal (untreated) group
 D) an experimentalgroup
 E) a"zero-value" group

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Gradable : automatic
Section : 01.03
Topic : Scientific Method
Learning Outcome : 01.03.02 Identify the variables in an experiment.

**19)** A theory differs from a hypothesis in that a theory

 A) has more supportive research evidence than a hypothesis.
 B) is broader inscope than a hypothesis.
 C) has predictive power for similar phenomena that haven't been observed yet.
 D) ties together many existing observations.
 E) All of the answerchoicesare correct.

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Gradable : automatic
Section : 01.03
Topic : Scientific Method
Learning Outcome : 01.03.03 Differentiate between hypotheses, theories, and facts.

**20)** A structure, such as a flower in plants, or a liver in animals, consisting of tissues organized to carry out a specific function is a(n)

 A) organ.
 B) cell.
 C) population.
 D) molecule.
 E) organelle.

 **Question Details**Bloom's : 1. Remember
Learning Outcome : 01.01.02 Give examples of each level of biological organization.
Section : 01.01
Topic : Levels of Biological Organization
Accessibility : Keyboard Navigation
Gradable : automatic
Topic : Characteristics of Life

**21)** An ecosystem would include all of the following except

 A) a community that may include primary producers, consumers, and decomposers.
 B) the biosphere,with its resources and functioning systems.
 C) populations oforganisms in the same species.
 D) nonliving air, water, soil, and other components in an area.
 E) None of the answer choices are correct.

 **Question Details**Bloom's : 1. Remember
Learning Outcome : 01.01.02 Give examples of each level of biological organization.
Section : 01.01
Topic : Levels of Biological Organization
Accessibility : Keyboard Navigation
Gradable : automatic
Topic : Characteristics of Life

**22)** A researcher collected a single-celled organism from birdbath water and grew the organism in a laboratory. The researcher observed the organism reproducing by cell division, which resulted in identical offspring generations. This organism exhibits a form of

 A) asexual reproduction.
 B) reproduction that produces enormous genetic diversity among offspring
 C) reproduction occurring only in bacteria.
 D) sexual reproduction, mixing genetic material from the parent cells.
 E) sexual reproduction of fungi.

 **Question Details**Learning Outcome : 01.01.02 Give examples of each level of biological organization.
Section : 01.01
Topic : Levels of Biological Organization
Accessibility : Keyboard Navigation
Gradable : automatic
Bloom's : 2. Understand
Topic : Characteristics of Life

**23)** Homeostasis means that

 A) a populationchanges over time.
 B) environmentalconditions are held constant and do not change.
 C) cells have enoughwater.
 D) all organismsrequire an energy source.
 E) conditions insidea cell or organism remain within a constant range.

 **Question Details**Bloom's : 1. Remember
Section : 01.01
Accessibility : Keyboard Navigation
Gradable : automatic
Learning Outcome : 01.01.01 Describe the characteristics that all living organisms share.
Topic : Characteristics of Life
Topic : Homeostasis

**24)** The correct sequence going from smallest to largest is

 A) tissue - cell -organelle - molecule - atom.
 B) molecule - atom - organelle - tissue - cell.
 C) atom - molecule -organelle - cell - tissue.
 D) cell - tissue -organelle - molecule - atom.
 E) cell - molecule - tissue - organelle - atom.

 **Question Details**Bloom's : 1. Remember
Learning Outcome : 01.01.02 Give examples of each level of biological organization.
Section : 01.01
Topic : Levels of Biological Organization
Accessibility : Keyboard Navigation
Gradable : automatic

**25)** All ecosystems

 A) need a source of external energy.
 B) stay exactly thesame once mature.
 C) are entirelyself-sufficient.
 D) consist of onlyliving organisms.
 E) None of the answer choices are correct.

 **Question Details**Bloom's : 1. Remember
Learning Outcome : 01.01.02 Give examples of each level of biological organization.
Section : 01.01
Topic : Levels of Biological Organization
Accessibility : Keyboard Navigation
Gradable : automatic

**26)** Which is the correct sequence of steps in the scientific method?

 A) make an observation - analyze results - form hypothesis - draw conclusions - design an experiment
 B) make an observation - analyze results - draw conclusion - design an experiment - form hypothesis
 C) make an observation - form hypothesis - design an experiment - collect data - analyze results
 D) form hypothesis - make an observation - design an experiment - collect data - analyze results
 E) form hypothesis - make an observation - collect data - analyze results - design an experiment

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Gradable : automatic
Section : 01.03
Learning Outcome : 01.03.01 Apply the scientific method to design experiments and analyze data.
Topic : Scientific Method

**27)** A college student has a new job, and must balance classes and commute times to work. The student takes two weeks to drive from campus to the workplace by several routes, including a direct route through town, a highway route, and a route through a city park. Comparing the drive times affected by the route is possible. The dependent variable is the

 A) average time in minutes it takes to drive from campus to workplace.
 B) distance in miles of each possible driving route from campus to workplace.
 C) the number of cars in the same route.
 D) the time in minutes between walking from class to their vehicle.
 E) the type of vehicle the student is driving.

 **Question Details**Accessibility : Keyboard Navigation
Gradable : automatic
Bloom's : 2. Understand
Section : 01.03
Learning Outcome : 01.03.01 Apply the scientific method to design experiments and analyze data.
Topic : Scientific Method

**28)** A golfer wants a new set of clubs to improve her game. In an experiment, she tests different drivers made from different materials. She compares the drivers to the distance of her shot. In this simple experiment, the independent variable is the

 A) wind directionwhen the experiment took place.
 B) distance the golfball traveled.
 C) type of material used to make the golf ball.
 D) swing speed of the golf club prior to striking the golf ball.
 E) type of material used to make the drivers.

 **Question Details**Accessibility : Keyboard Navigation
Gradable : automatic
Bloom's : 2. Understand
Section : 01.03
Topic : Scientific Method
Learning Outcome : 01.03.02 Identify the variables in an experiment.
Topic : Experimental Design

**29)** A golfer wants a new set of clubs to improve her game. In an experiment, she goes to the driving range and compares the distance she hits a bucket of golf balls with drivers of different materials in the clubs before making her purchase decision. In this simple experiment, the standardized variable is the

 A) wind directionwhen the experiment took place.
 B) force generated by her swing, when hitting the ball.
 C) type of materialused to make the golf ball.
 D) all of these except the type of material used to make the club.
 E) angle the ball was hit by the head surface of the club.

 **Question Details**Accessibility : Keyboard Navigation
Gradable : automatic
Bloom's : 2. Understand
Section : 01.03
Learning Outcome : 01.03.01 Apply the scientific method to design experiments and analyze data.
Topic : Scientific Method
Topic : Experimental Design

**30)** Scientists have developed an ointment to decrease muscle inflammation after intense workouts or trainings. To test the product, 99 weight lifters are divided into three equal groups. Group 1 is given the actual ointment, Group 2 is given an inactive ointment that looks and smells like the active ointment, and Group 3 is not allowed to use any treatment. Group 2 has been given

 A) a placebo.
 B) an independent variable.
 C) a standardized variable.
 D) the active ointment.
 E) a controlvariable.

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Gradable : automatic
Section : 01.03
Learning Outcome : 01.03.01 Apply the scientific method to design experiments and analyze data.
Topic : Experimental Design

**31)** In an experiment, which of the following is not generally a true statement?

 A) The larger the sample size the more reliable the results.
 B) The smaller the sample size the more reliable the results.
 C) Without the propercontrol an experiment is not valid.
 D) It is important tostandardize aspects of an experiment that might affect the outcome, other thanthe independent variable.
 E) None of the answer choices are correct.

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Gradable : automatic
Section : 01.03
Learning Outcome : 01.03.01 Apply the scientific method to design experiments and analyze data.
Topic : Experimental Design

**32)** What did Charles Darwin propose after observing the 11-inch-long nectaries of the *Angraecum sesquipedale* orchid in Madagascar?

 A) the existence ofa pollinator moth with a proboscis of 10 **–**11 inches
 B) the presence ofvery small bees that can fit into a long nectar tube
 C) that the orchidmust reproduce asexually
 D) that the orchidwas an evolutionary dead end and could no longer reproduce
 E) that the orchid was a self-pollinator and required no assistance from an organism

 **Question Details**Accessibility : Keyboard Navigation
Gradable : automatic
Bloom's : 2. Understand
Topic : Scientific Method
Learning Outcome : 01.03.03 Differentiate between hypotheses, theories, and facts.
Type : Investigating Life
Section : 01.04

**33)** After observing variability among plant and animal species in various locations, Charles Darwin proposed an explanation for what he saw. The broad proposal included reasons that species could be modified through genetic variation, leading to measurable similarity and difference. Evidence for the proposal came from biological, geographic, and geological observations. His proposal allowed for the prediction of new species that might be found in new settings, based on environmental conditions. Darwin's proposal is an example of

 A) a standardizedvariable.
 B) a theory.
 C) an independentvariable.
 D) a dependentvariable.
 E) a hypothesis.

 **Question Details**Accessibility : Keyboard Navigation
Gradable : automatic
Bloom's : 2. Understand
Section : 01.03
Topic : Scientific Method
Learning Outcome : 01.03.03 Differentiate between hypotheses, theories, and facts.
Topic : Experimental Design

**34)** Charles Darwin observed an orchid flower with very long, thin tubes that prevent many species from feeding on the flower nectar and pollinating the flower. He offered a prediction that some species of pollinators would eventually be found that can feed and pollinate through the small tube.
 You decide to test Charles Darwin's proposal by placing nets over some orchids that allow small pollinators to enter, but prevent the large sphinx moth from entering. You then compare the number of seeds produced by plants with and without the nets. The seed production is

 A) a dependentvariable.
 B) a hypothesis.
 C) a theory.
 D) an independentvariable.
 E) a standardizedvariable.

 **Question Details**Accessibility : Keyboard Navigation
Gradable : automatic
Section : 01.03
Learning Outcome : 01.03.01 Apply the scientific method to design experiments and analyze data.
Topic : Scientific Method
Bloom's : 3. Apply
Learning Outcome : 01.03.02 Identify the variables in an experiment.
Topic : Experimental Design
Type : Investigating Life
Section : 01.04

**35)** Darwin observed an orchid flower with petals arranged in very long, thin tubes, rather than broad and flat, as we might see in other common flowers. What is the advantage to the orchid having an 11-inch-long nectartube arrangement of the petals?

 A) The flower can produce nectar more easily spread over a larger area to attract more pollinators.
 B) The flower nectartube can collect more rainwater to maintain health of the flower.
 C) The flower canonly be pollinated by a specifically adapted pollinator, reducingcross-fertilization among orchid species.
 D) The flower can collect more sunlight for photosynthesis.
 E) The long tube can trap insects as a source of nutrients.

 **Question Details**Accessibility : Keyboard Navigation
Gradable : automatic
Bloom's : 4. Analyze
Learning Outcome : 01.03.01 Apply the scientific method to design experiments and analyze data.
Topic : Scientific Method
Type : Investigating Life
Section : 01.04

**36)** What is the advantage to the sphinx moth *Xanthopan morgani* by having an 8-inch-long tongue?

 A) It is used toattract mates through sexual selection.
 B) It can onlypollinate one type of flower.
 C) It makes flyingmore efficient.
 D) It can be used tocapture other flying insects for food.
 E) It can reachnectar that no other pollinator can reach.

 **Question Details**Accessibility : Keyboard Navigation
Gradable : automatic
Bloom's : 2. Understand
Topic : Experimental Design
Type : Investigating Life
Section : 01.04
Learning Outcome : 01.04.01 Explain how observations of orchids and moths confirmed a prediction of e

**37)** Given basic information from observations of the orchid with a long nectary, and the moth with the long proboscis, what is the advantage to a plant like an orchid producing nectar over a plant like a pine tree that does not produce nectar?

 A) Nectar helpsdisperse pollen by wind.
 B) Nectar attractsanimals that perform pollination.
 C) Nectar providesfood for the pollen and growing fruit.
 D) Nectar helpsdisperse pollen by water.
 E) Nectar provides asticky surface for pollen to attach to, promoting fertilization.

 **Question Details**Accessibility : Keyboard Navigation
Gradable : automatic
Topic : Scientific Method
Bloom's : 3. Apply
Type : Investigating Life
Section : 01.04
Learning Outcome : 01.04.01 Explain how observations of orchids and moths confirmed a prediction of e

**38)** You are feeling ill, so you visit a physician. The physician takes your temperature, blood pressure, and pulse and orders blood tests and urine analysis to determine more about your condition. The results of all of these observations and tests will help the physician assess why your body is temporarily out of "normal" conditions, or when the body is not adequately

 A) maintaining homeostasis.
 B) evolving.
 C) adapting.
 D) reproducing.
 E) organized.

 **Question Details**Section : 01.01
Accessibility : Keyboard Navigation
Gradable : automatic
Bloom's : 2. Understand
Learning Outcome : 01.01.01 Describe the characteristics that all living organisms share.
Topic : Characteristics of Life

**39)** Before biologists discovered the role of DNA and chromosomes,Gregor Mendel, a scientific researcher, studied the genetics of pea plants related to flower colors, pea colors, pea pod shapes, and other features of the plant.
 He numerically modeled the results he observed and published results, which eventuallyled to our basic understanding of how biological traits are passed to new generations of organisms.
 His work, however, was largely rejected for over 30 years, partly for minor record-keeping errors, and partly for the new approach of defining reproduction of organisms in terms of numerical probabilities. This demonstrates that

 A) scientific evidence is harder to accept because of cultural biases and misunderstandings on the topic.
 B) Gregor Mendel's work wasn't valid until researchers later identified chromosomes and their role in reproduction.
 C) a unique, new way to propose a theory discredits the research until someone else proves findings to be true.
 D) only the most recent scientific investigations on a topic are useful in understanding biological conditions or processes.
 E) the color and shape of peas was not important to the scientific community.

 **Question Details**Accessibility : Keyboard Navigation
Gradable : automatic
Section : 01.03
Topic : Scientific Method
Bloom's : 5. Evaluate
Learning Outcome : 01.00.01 Describe how science is used to study life.
Learning Outcome : 01.03.04 Explain the limitations of the scientific method.

**40)** Viruses are not considered an organism because they don't have cell membranes, organelles, and do not carry out vital life functions, although they do have a form of DNA (or similar RNA). A researcher proposing to categorize viruses in the tree of life would need to

 A) propose a genetic relationship to living organisms and test how viruses lost life characteristics over time.
 B) establish any virus as a control group for experimentation with established domains of organisms.
 C) apply his/her proposal to any newly discovered virus, since others aren't currently considered organisms.
 D) remember that the scientific method will prevent any changes to the current taxonomy and tree of life.
 E) show the importance of genetic information as a characteristic of life.

 **Question Details**Section : 01.01
Topic : Levels of Biological Organization
Accessibility : Keyboard Navigation
Gradable : automatic
Learning Outcome : 01.01.01 Describe the characteristics that all living organisms share.
Topic : Characteristics of Life
Learning Outcome : 01.02.01 Compare and contrast the three branches of life.
Section : 01.02
Bloom's : 4. Analyze
Section : 01.03
Learning Outcome : 01.03.01 Apply the scientific method to design experiments and analyze data.

**41)** Health care and fitness professionals claim moderate exercise yields heart health.
 In an attempt to study the effect of moderate exercise on heart health, you track four groups of fellow students through a semester. One group is a control, who are not to change their exercise patterns. The three other groups are assigned to a 30-minute exercise once, twice, or three times a week.
 Results at the end of the semester show that average blood pressure and pulse rates are nearly the same for the control group as the once-a-week exercisers. Average blood pressure and pulse were slightly lower for the two groups that exercised more often, but not every student showed any difference, and some actually had increased blood pressure and pulse rates.
 What conclusions can be drawn fromthe data collected?

 A) Measured differences in the average blood pressure and pulse of the three experimental groups will not likely show a statistically significant difference from the control group.
 B) Measured differences in the average blood pressure and pulse of the once-a-week exercise group and the control group will likely show a statistically significant difference from the groups exercising more often.
 C) The individual student data variability and even increased blood pressure and pulse in the two groups exercising more often will not change the fact that the average data values will prove to be statistically significant in difference from the control group.
 D) The measured blood pressure and pulse data values of the control group and three exercising groups in this study prove that moderate exercise does not have any beneficial impact on heart health.
 E) A conclusion cannot be drawn based on the information provided.

 **Question Details**Accessibility : Keyboard Navigation
Gradable : automatic
Section : 01.03
Learning Outcome : 01.03.01 Apply the scientific method to design experiments and analyze data.
Topic : Scientific Method
Topic : Experimental Design
Bloom's : 5. Evaluate
Learning Outcome : 01.00.01 Describe how science is used to study life.

**42)** You perform an experiment in which you take 16 pots of strawberry plants and give half of them 1 gram of ammonium nitrate per liter of water and the other half just gets water. Each group is then split in half again, and exposed to either 8 or 16 hours of light each day. You monitor the height of the plants for four weeks. You observe that increasing ammonium nitrate and light both increase plant height.

 **Question Details**Topic : Experimental Design

**42.1)** Which of the following is/are an independent variable(s) in this experiment?

 A) the amount ofammonium nitrate and light
 B) the amount ofammonium nitrate
 C) the amount oflight
 D) the height of theplants and amount of light
 E) the height of theplants

 **Question Details**Accessibility : Keyboard Navigation
Gradable : automatic
Bloom's : 2. Understand
Section : 01.03
Learning Outcome : 01.03.02 Identify the variables in an experiment.
Topic : Experimental Design

**42.2)** Which of the following is/are a dependent variable(s) in this experiment?

 A) the amount ofammonium nitrate and light
 B) the amount ofammonium nitrate
 C) the amount oflight
 D) the height of theplants
 E) the height of theplants and amount of light

 **Question Details**Accessibility : Keyboard Navigation
Gradable : automatic
Bloom's : 2. Understand
Section : 01.03
Learning Outcome : 01.03.01 Apply the scientific method to design experiments and analyze data.
Topic : Experimental Design

**42.3)** In this experiment, you are working with available planter pots from the laboratory. You have choices of clay pots of different sizes, as well as biodegradable peat pots and others within lab equipment provided. To establish a standardized variable, you would

 A) choose clay pots for the fertilized plants, and biodegradable pots for the unfertilized plants.
 B) monitor the strawberry growth rates and determine a mathematical correction to account for the type and size of pot used.
 C) select all sixteen pots to be of the same material and size for the experiment.
 D) report the pot type used, though recognizing the pot is not as important as fertilizer and light to the strawberries.
 E) select a variety of sizes based on the initialstrawberry plant size.

 **Question Details**Accessibility : Keyboard Navigation
Gradable : automatic
Section : 01.03
Learning Outcome : 01.03.01 Apply the scientific method to design experiments and analyze data.
Bloom's : 3. Apply
Topic : Experimental Design

**42.4)** A plant takes up nutrients like ammonium nitrate to maintain

 A) asexualreproduction.
 B) sexualreproduction.
 C) naturalselection.
 D) evolution.
 E) homeostasis.

 **Question Details**Bloom's : 1. Remember
Section : 01.01
Accessibility : Keyboard Navigation
Gradable : automatic
Learning Outcome : 01.01.01 Describe the characteristics that all living organisms share.
Topic : Characteristics of Life
Section : 01.03
Learning Outcome : 01.03.01 Apply the scientific method to design experiments and analyze data.
Topic : Experimental Design

**42.5)** The leaf of a plant is

 A) an organ.
 B) a molecule.
 C) an organelle.
 D) a cell.
 E) an organism.

 **Question Details**Bloom's : 1. Remember
Learning Outcome : 01.01.02 Give examples of each level of biological organization.
Section : 01.01
Topic : Levels of Biological Organization
Accessibility : Keyboard Navigation
Gradable : automatic
Topic : Characteristics of Life

**42.6)** A plant is a

 A) consumer.
 B) decomposer.
 C) primary producer.
 D) consumer anddecomposer.
 E) consumer andproducer.

 **Question Details**Bloom's : 1. Remember
Learning Outcome : 01.01.02 Give examples of each level of biological organization.
Section : 01.01
Accessibility : Keyboard Navigation
Gradable : automatic
Topic : Characteristics of Life

**42.7)** Organisms require energy to function. What is the energy source for the plants in your experiment?

 A) ammoniumnitrate
 B) light
 C) water
 D) soil
 E) carbondioxide

 **Question Details**Bloom's : 1. Remember
Section : 01.01
Accessibility : Keyboard Navigation
Gradable : automatic
Learning Outcome : 01.01.01 Describe the characteristics that all living organisms share.
Topic : Characteristics of Life

**42.8)** As part of observation in your scientific method, you discover that your strawberry plants are producing plantlets that are identical to the parent plant. This demonstrates that they reproduce by

 A) asexual reproduction.
 B) sexual reproduction.
 C) development and adaptation.
 D) development and maturation.
 E) fragmentation.

 **Question Details**Section : 01.01
Accessibility : Keyboard Navigation
Gradable : automatic
Bloom's : 2. Understand
Learning Outcome : 01.01.01 Describe the characteristics that all living organisms share.
Topic : Characteristics of Life

**43)** This figure shows graphed medical research results from a study on a new vaccine. The research was done in an effort to determine if a new vaccine would be effective in preventing potentially dangerous rotavirus infections in infants. Green data bars represent occurrence of infant cases that had normal rotavirus strains that aren't critically dangerous. Blue data bars represent occurrence of infant cases that had more dangerous rotavirus strains that can hospitalize or lead to fatality of infants.


 **Question Details**Topic : Scientific Method
Topic : Experimental Design

**43.1)** In this diagram, the vertical axis of the graph shows values of "Incidence of Illness" in infants. The varying numbers of infants getting sick with rotavirus represents the

 A) dependent variable of this medical study.
 B) independent variable of this medical study.
 C) standardized variable of this medical study.
 D) control group of infants in this medical study.
 E) normal infant baseline for reference to results from this medical study.

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Gradable : automatic
Section : 01.03
Learning Outcome : 01.03.02 Identify the variables in an experiment.
Topic : Experimental Design

**43.2)** In the graph, interpret the data that are shown regarding the response of a large number of infants to vaccination from dangerous rotavirus infection. Which of the hypotheses is NOT supported by these data results?

 A) The new vaccine is ineffective in protecting infants from any rotavirus infection.
 B) The high dose of the new vaccine does not offer any stronger protection from any rotavirus infection than the medium dose.
 C) The low dose of the vaccine reduces incidence of illness from any rotavirus in general, and also severe rotavirus.
 D) Medium and high doses of the vaccine are more effective at reducing severe rotavirus illnesses than reducing any rotavirus.
 E) Hypotheses about the vaccine doses can't be evaluated because the placebo group is biased, with high incidence of illness in those infants.

 **Question Details**Accessibility : Keyboard Navigation
Gradable : automatic
Bloom's : 4. Analyze
Section : 01.03
Learning Outcome : 01.03.01 Apply the scientific method to design experiments and analyze data.
Topic : Scientific Method

**43.3)** In the graph, the horizontal axis is showing different doses of vaccine, including "placebo," "low," "medium," and "high." These levels of vaccine were applied to different groups of babies to test if and how much the vaccination helped reduce the incidence of rotavirus, an illness that can quickly dehydrate infants to critical or fatal levels. These dosages in this medical study represent

 A) the independent variable.
 B) the standardized variable.
 C) the dependent variable.
 D) the control group.
 E) the placebo.

 **Question Details**Accessibility : Keyboard Navigation
Gradable : automatic
Bloom's : 4. Analyze
Section : 01.03
Learning Outcome : 01.03.02 Identify the variables in an experiment.
Topic : Experimental Design

**43.4)** In this experiment, if the scientists administering the treatments (low, medium, or high vaccine doses, as well as the placebo) did not know which dose they were administering, then this would be an example of a double-blind experiment.

 ⊚ true
 ⊚ false

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Gradable : automatic
Section : 01.03
Topic : Scientific Method
Learning Outcome : 01.03.02 Identify the variables in an experiment.
Topic : Experimental Design

**44)** The kingdom is the most all-inclusive taxonomic category.

 ⊚ true
 ⊚ false

 **Question Details**Bloom's : 1. Remember
Topic : Levels of Biological Organization
Accessibility : Keyboard Navigation
Gradable : automatic
Learning Outcome : 01.02.01 Compare and contrast the three branches of life.
Section : 01.02

**45)** The cell is the basic unit of life.

 ⊚ true
 ⊚ false

 **Question Details**Bloom's : 1. Remember
Learning Outcome : 01.01.02 Give examples of each level of biological organization.
Section : 01.01
Topic : Levels of Biological Organization
Accessibility : Keyboard Navigation
Gradable : automatic
Learning Outcome : 01.01.01 Describe the characteristics that all living organisms share.
Topic : Cell Theory

**46)** The smallest scale of biological organization is represented by organelles.

 ⊚ true
 ⊚ false

 **Question Details**Bloom's : 1. Remember
Learning Outcome : 01.01.02 Give examples of each level of biological organization.
Section : 01.01
Topic : Levels of Biological Organization
Accessibility : Keyboard Navigation
Gradable : automatic
Topic : Cell Theory

**47)** Decomposers are a special group of primary producers.

 ⊚ true
 ⊚ false

 **Question Details**Bloom's : 1. Remember
Learning Outcome : 01.01.02 Give examples of each level of biological organization.
Section : 01.01
Accessibility : Keyboard Navigation
Gradable : automatic
Topic : Characteristics of Life

**48)** In an experiment designed to determine if a fertilizer increased crop yield in tomato plants, the number of tomatoes produced by each plant would be the independent variable.

 ⊚ true
 ⊚ false

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Gradable : automatic
Section : 01.03
Learning Outcome : 01.03.02 Identify the variables in an experiment.
Topic : Experimental Design

**49)** In an experiment designed to determine if a fertilizer increased crop yield in tomato plants, the number of tomatoes produced by each plant would be the dependent variable.

 ⊚ true
 ⊚ false

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Gradable : automatic
Section : 01.03
Learning Outcome : 01.03.02 Identify the variables in an experiment.
Topic : Experimental Design

**50)** In an experiment designed to determine if a fertilizer increased crop yield in tomato plants, the amount of sunlight and water the plants received would be standardized variables.

 ⊚ true
 ⊚ false

 **Question Details**Accessibility : Keyboard Navigation
Gradable : automatic
Bloom's : 2. Understand
Section : 01.03
Learning Outcome : 01.03.01 Apply the scientific method to design experiments and analyze data.
Topic : Experimental Design

**51)** A theory is an advanced hypothesis that has been proven to be true.

 ⊚ true
 ⊚ false

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Gradable : automatic
Section : 01.03
Topic : Scientific Method
Learning Outcome : 01.03.03 Differentiate between hypotheses, theories, and facts.
Topic : Experimental Design

**52)** Researchers can readily extract DNA from one organism and merge that DNA into another organism, applying genetic engineering as a possible cure to cancer or muscular dystrophy and other diseases. The scientific method can test a hypothesis to determine if this approach is morally right or wrong.

 ⊚ true
 ⊚ false

 **Question Details**Accessibility : Keyboard Navigation
Gradable : automatic
Section : 01.02
Topic : Scientific Method
Bloom's : 3. Apply
Topic : Experimental Design
Learning Outcome : 01.03.04 Explain the limitations of the scientific method.

**Answer Key**Test name: Chapter 01

1) A

The scale of biological organization ranges from the smallest structure (an atom) to the largest (a biosphere). Read section 1.1A.

2) D

The scale of biological organization ranges from the smallest structure (an atom) to the largest (a biosphere). Read section 1.1A.

3) A

Structural components, their organization, chemical and energy interactions, reproduction, and population genetic changes function as more than the sum characteristics. Read section 1.1.A for more information.

4) B

"Life" or "living" is a broader concept in biology than "alive." An individual organism represents "life" because it has all these characteristics. Cell features are relatively similar among all known organisms. Read section 1.1 for information, and see if you can remember the diversity of what has already been presented to you as "life."

5) B

Even among similar organizations, some characteristics may exist in addition to the basic characteristics that define "life." Read sections 1.1.A through 1.1.E for more information.

6) C

Related to the energy we need, or that bacteria or plants need, our metabolism requires energy transfers to ensure vital cell functions can be carried out. Read section 1.1.B for more information.

7) C

Related to the energy we need, or that bacteria or plants need, our metabolism requires energy transfers to ensure vital cell functions can be carried out. Read section 1.1.B for more information.

8) E

Refer to section 1.1.

9) A

Taxonomy, which is naming of organisms, provides identification common to all researchers, so there is no duplication or omission in studying the organisms. Read section 1.2 for the introduction to the three main taxonomic branches of life.

10) C

Taxonomy, which is naming of organisms, provides identification common to all researchers, so there is no duplication or omission in studying the organisms. Read section 1.2 for the introduction to the three main taxonomic branches of life.

11) B

Prokaryotes are considered more simplified, smaller, and usually single-celled organisms in comparison to eukaryotes. A useful root word to understand is *-karyote*,which is a descriptor of the nucleus. Read section 1.2 for more information, plus review the molecule, organelle, and cell levels of biological organization in section 1.1.A.

12) A

Taxonomy of organisms is a useful tool in categorizing, so that scientific efforts are not duplicated or omitted among the wide diversity of life. If new information is found to be meaningful, then new categories, or even levels of categories, can be developed. Read sections 1.1 and 1.2, along with section 1.3.A for more integrative understanding.

13) D

Each person learns to talk, count, tie shoes, find classrooms, and decide on best routes to and from work, among many examples, with reasoning that resembles the formal stages of the scientific method. Read section 1.3.A for more information.

14) A

The hypothesis is the first proposed statement of possible research outcomes, guiding researchers to test for support, through collection and analysis of new data. Read section 1.3.A for more information.

15) D

Choosing and establishing the correct variables is crucial to research, guided by relevance and whether or not the experiment will allow testing of hypotheses. Read section 1.3.B for more information.

16) A

Visual representation of proposed relationships among organisms can vary among researchers, based on information available, such as their body form or DNA genetic information. Read section 1.2 for more information.

17) B

Choosing and measuring the way a system responds to manipulation of variables is crucial in analysis of new data collected, in support or lack of support for hypotheses. Read section 1.3.B for more information.

18) D

Experimental control groups allow the researcher to discern from natural variability, or baseline values, that might be expected, separate from variables manipulated in the experimental setup. Read section 1.3.B for more information.

19) E

Researchers test individual hypotheses in each experiment, but use inductive reasoningafter many observations to offer explanations for what has been observed. Theories can be developed, modified, or abandoned as new information is gained from research. In some biological fields, there can even be "competing" or alternative theories.

20) A

Composed of components of smaller, less complex scale of function, the organ has an overall form and function specific to the needs of the organism. Read section 1.1.A and study figure 1.2 for more information.

21) B

At the ecosystem level, the organisms and their environmental conditions are all considered, within a particular geographic area. Read section 1.1.A and study figure 1.2 for more information.

22) A

Reproductive strategies vary, but are either sexual or asexual. Prokaryotes can only reproduce offspring asexually. Some eukaryotes reproduce offspring sexually only, or both sexually and asexually, depending on environmental conditions. Read section 1.1.D for more information.

23) E

From the cell to the entire organism, there is a constant range of internal conditions that vital processes are used to maintain, regardless of environmental conditions outside of the organism. Injury, illness, or death can occur if the internal conditions vary beyond the normal range. Read section 1.1.C for more information.

24) C

The Eukaryadomain has numerous examples of tissues that are groups of cells with specific form and function, which is only possible when the smaller-scale components are distinctly organized. Read section 1.1.A for more information.

25) A

Ecosystems, like other earth systems, include the living and nonliving resources and components; energy exchanges drive all the processes that are relevant to life. Read section 1.1.A for more information.

26) C

Observation of the biological system can include preliminary studies, reading of literature already published, and gaining other information about the system, guiding you to relevant hypotheses. From there, experiments must be designed to directly address the hypothesis, so that new data can be collected and interpreted. Read section 1.3.A for more information.

27) A

This is a common, everyday application that students might face. The "experiment" may actually change each semester as new class schedules arise. The dependent variable is still the information of interest, so that the student can apply lessons learned to future commutes. Read section 1.3.B for more information.

28) E

The scientific method can be applied to numerous situations. In this example, the type of driver is of importance to the golfer, and can be manipulated by choosing to compare different qualities of the drivers to be tested. Read section 1.3.B for more information.

29) D

This is an example of applying the scientific method to everyday life. In this experiment, it would be important that the golfer is consistent, and keeps her swing, the bucket of golf balls and other factors besides the clubs material as much the same as possible.

30) A

Medical research and development relies on placebos to establish a baseline reference to how people respond to the medications, and allow comparison with responses when no medication is actually given. Read section 1.3.B for more information.

31) B

Between observing a phenomenon only once, and observing all possible occurrences of it, sample size is designed into experiments in order to make enough observations to have confidence that newly recorded data are representative of what can be expected. In a small sample, each variation changes analysis widely, but the effect on analysis diminishes to a small amount when a larger sample size is adequate.

32) A

Within a theory, there is predictive power for new observations and situations. Darwin's theory of evolution predicted that an unusual flower structure would be accompanied by pollinator species that could take advantage of the long nectary tubes of a particular orchid. Read section 1.4 for more information.

33) B

Darwin's proposal, centered on natural selection to modify populations of species through time, offers a set of observable reasons it might happen, and also allows for predictions that may expand understanding. Read section 1.3.C for more information.

34) A

Pollination is required for the orchid flowers to reproduce seeds for a new generation of flowers.The number of seeds produced relates to the success of pollinator species in reaching the flowers. Read sections 1.3.B and 1.4 for more information.

35) C

Flower petals have varied arrangements, to attract varied pollinators. Read section 1.4 for more information about the unusually shaped orchid flowers.

36) E

The uniquely long proboscis provides an advantage to the moth for pollinating the one orchid species, but does not inherently prevent it from pollinating other flower species. Read section 1.4 for more information.

37) B

This question goes beyond observed information presented in the text, to your consideration of how the organism can survive with a different strategy than other plants that may live nearby in the same ecosystem. Read section 1.4 for more information.

38) A

Your normal health is a relatively constant balance of internal conditions of water, salts, proteins, temperature, and many other conditions. Physicians are sought for healing when injury or illness force your internal conditions out of the normal range. Some of the symptoms may be signs that your body is sensing and responding in attempt to recover normal internal conditions. Read section 1.1.C for more information.

39) A

You'll read about Gregor Mendel's contributions in a later chapter. His conclusions and theory still represent a basic, valid explanation of how all organisms can possess and pass on genetically inherited traits of body form, appearance, health, and other conditions. Despite the rigor of his studies, his theories were rejected until decades after his death. Read section 1.3.D for more understanding, with the similar example of our understanding of ulcers.

40) A

Hypotheses are generally tested separately, while theories offer broadly supported explanation of observed information. If new information or understanding is found, theories can be abandoned or modified. Read sections 1.1, 1.2, and 1.3 for a more integrative understanding.

41) A

In scientific investigation, statistics test to determine if the data tend to support, or fail to support, a hypothesis. In this example, data are described in terms indicating variability and little difference between the control group, or any experimental group. Statistical analysis would tend not to support a hypothesis that moderate exercise has heart health benefits, because the variation was observed in all groups. Read sections 1.0 and 1.3.B for more information.

42) Section Break

42.1) A

In this experiment, sixteen potted plants were studied. Eight of them were subjected to fertilizer treatment, and eight without fertilizer. Groups of four plants were subjected to more or less available light for growth. These represented manipulations of variables by the researcher. Read section 1.3.B for more information.

42.2) D

In this experiment, four plants each are subjected to fertilizer and high light, fertilizer and low light, no fertilizer and high light, and no fertilizer and low light. The plant height is measured as a response to the different combinations of fertilizer and light. Read section 1.3.B for more information.

42.3) C

In this experiment, observation of how potted plants grow would indicate that size and materials of pots can have some effect on growth of plants, not accounted for by fertilizer and light that you are studying. Read section 1.3.B for more information.

42.4) E

This is an example of how a normal need for life and growth of the strawberries can be manipulated by researchers to discover beneficial or harmful responses in the presence of varying amounts of the particular nutrient. Read sections 1.1 and 1.3 for more understanding of how the study relates to the basic life characteristics.

42.5) A

In an example of scientific investigation, the context of each leaf can relate to growth responses of the entire strawberry plant. Read section 1.1.A for more information.

42.6) C

In an example of scientific investigation, the context of each strawberry plant relates to its growth responses to fertilizer and light. Read section 1.1.A for more information.

42.7) B

From the strawberry seed, to the embryonic plant, to the mature plant potted and subjected to fertilizer and different amounts of light, the plants need energy input to carry out vital life functions. Read section 1.1.B for more information.

42.8) A

Reproduction of offspring among organisms is variable, between sexual and asexual strategies. Growth and specialization of the cells and tissues of organisms operates at different scales from production of the offspring, driven by cell division. Read section 1.1.D for more information.

43) Section Break

43.1) A

The measured response of system components being studied (vaccinated infants) will allow researchers to assess if there was a response to the independent variable, or if there is variability that comes from other normal factors affecting the infants' health, or from different established dosage levels of the vaccine. Read section 1.3.B for more information.

43.2) A

As a guide to the experimental design, and analysis of the data results, the wording of the hypotheses must contain specific statements of responses. Stated as fact, the experiment provides a means of collecting new information that will either support the hypothesis or not. Read section 1.3.B for more information.

43.3) A

If the vaccine is being tested for effectiveness, this study is testing different levels of doses from a group having no dose, to low, medium, and high doses to determine any beneficial responses. Read section 1.3.B for more information.

43.4) TRUE

An investigator's awareness of medical doses can potentially influence test-subject responses because of verbal and nonverbal communication. Read section 1.3.B for more information.

44) FALSE

Within the hierarchy of taxonomic categories, kingdoms include large groups of similar organisms, but are still subsets of the broad domains. Read section 1.2 for more information.

45) TRUE

Organization at different scales of complexity, energy requirements, homeostasis, reproduction, and evolutionary changes of populations all occur in "life," but require the cell in which to support the vital chemical and energy reactions. Read section 1.1.A for more information.

46) FALSE

Life has a chemical makeup at two smaller scales than cells and their components. Read section 1.1.A for more information on the different scales of biological organization.

47) FALSE

The decomposers survive by breaking down the molecules and cells of organisms that have died, and are heterotrophs, because they cannot produce their own nutrient molecules from nonliving environmental resources. Read section 1.1.B for more information.

48) FALSE

Fertilizer effects on the size and numbers of tomatoes produced by the plants would be a specific variable of interest in response to fertilizer application. Read section 1.3.B for more information.

49) TRUE

The number or size of tomatoes produced by tomato plants is a variable that the researcher can assess as having any response to the application of fertilizer. Read section 1.3.B for more information.

50) TRUE

Standardized variables are held constant by researchers, so that no other factors besides the variables being manipulated for comparison will cause variation. Read section 1.3.B for more information.

51) FALSE

Scientists don't use "educated guesses" and "opinions" for hypotheses. Hypotheses are potential outcomes or explanations that can be tested one study at a time for support. Theories are broadly supported by evidence from numerous studies, propose explanation for the phenomenon, and offer predictive power for as yet unknown observations. Read sections 1.3.A and 1.3.C for more information.

52) FALSE

Biology graduate students and medical students are commonly required to take bioethics classes, because it is understood that scientific information and technology cannot effectively measure aesthetic value in arts, right or wrong values in morals, or acceptability of ethics. This limitation does not prevent scientists from measuring numbers of people who hold to specific values within a population. Read section 1.3.D for more information.