

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

1) What is a localized group of organisms that belong to the same species called?

- A) family B) biosystem C) ecosystem D) community E) population

Answer: E

2) Organisms interact with their environments, exchanging matter and energy. For example, what do plant chloroplasts convert the energy of sunlight into?

- A) oxygen
B) kinetic energy
C) the energy of motion
D) the chemical energy of chemical bonds
E) carbon dioxide and water

Answer: D

3) What does the main source of energy for producers in an ecosystem come from?

- A) water
B) the atmosphere
C) plants
D) solar energy
E) other animals as a food source

Answer: D

4) Which of the following types of cells utilize deoxyribonucleic acid (DNA) as their genetic material but do *not* have their DNA encased within a nucleus?

- A) plant B) animal C) protists D) archaea E) fungi

Answer: D

5) To understand the chemical basis of inheritance, we must understand the molecular structure of DNA. This is an example of the application of which concept to the study of biology?

- A) emergent properties
B) evolution
C) reductionism
D) the cell theory
E) feedback regulation

Answer: C

6) Once labour begins in childbirth, contractions increase in intensity and frequency until delivery. The increasing labour contractions of childbirth are an example of which type of regulation?

- A) a bioinformatic system
B) feedback inhibition
C) negative feedback
D) positive feedback
E) enzymatic catalysis

Answer: D

- 7) When the body's blood glucose level rises, the pancreas secretes insulin and, as a result, the blood glucose level declines. When the blood glucose level is low, the pancreas secretes glucagon and, as a result, the blood glucose level rises. What is this regulation of the blood glucose level the result of?
- A) bioinformatic regulation
 - B) positive feedback
 - C) negative feedback
 - D) catalytic feedback
 - E) protein-protein interactions

Answer: C

- 8) Which technology can analyze many biological samples very rapidly?
- A) bioinformatics
 - B) schematic biology
 - C) genomics
 - D) proteomics
 - E) evolution

Answer: A

- 9) Prokaryotes are classified as belonging to two different domains. What are the domains?
- A) Archaea and Monera
 - B) Bacteria and Archaea
 - C) Bacteria and Eukarya
 - D) Eukarya and Monera
 - E) Bacteria and Protista

Answer: B

- 10) Global warming, as demonstrated by observations such as melting of glaciers, increasing CO₂ levels, and increasing average ambient temperatures, has already had many effects on living organisms. Which of the following might best offer a solution to this problem?
- A) Do nothing; nature will attain its own balance.
 - B) Recycle as much as possible.
 - C) Continue to measure these and other parameters of the problem.
 - D) Increase the abilities of animals to migrate to more suitable habitats.
 - E) Limit the burning of fossil fuels and regulate our loss of forested areas.

Answer: E

- 11) A water sample from a hot thermal vent contained a single-celled organism that but lacked a nucleus. What is its most likely classification?
- A) Fungi
 - B) Eukarya
 - C) Protista
 - D) Archaea
 - E) Animalia

Answer: D

- 12) A filamentous organism has been isolated from decomposing organic matter. This organism has organelles and a cell wall but no chloroplasts. How would you classify this organism?
- A) domain Archaea, kingdom Bacteria
 - B) domain Eukarya, kingdom Protista
 - C) domain Eukarya, kingdom Fungi
 - D) domain Eukarya, kingdom Plantae
 - E) domain Bacteria, kingdom Prokaryota

Answer: C

13) Which of these provides evidence of the common ancestry of all life?

- A) ubiquitous use of catalysts by living systems
- B) structure of cilia
- C) near universality of the genetic code
- D) structure of chloroplasts
- E) structure of the nucleus

Answer: C

14) Which of the following is (are) *true* of natural selection?

- A) It involves differential reproductive success.
- B) It results in descent with modification.
- C) It results in descent with modification and involves differential reproductive success.
- D) It requires genetic variation.
- E) It requires genetic variation, results in descent with modification, and involves differential reproductive success.

Answer: E

15) Charles Darwin proposed a mechanism for descent with modification that stated that organisms of a particular species are adapted to their environment when they possess which of the following?

- A) inheritable traits that decrease their survival and reproductive success in the local environment
- B) non-inheritable traits that enhance their survival and reproductive success in the local environment
- C) inheritable traits that enhance their survival and reproductive success in the local environment
- D) non-inheritable traits that enhance their survival in the local environment
- E) non-inheritable traits that enhance their reproductive success in the local environment

Answer: C

16) Which of these individuals is likely to be most successful in an evolutionary sense?

- A) a reproductively sterile individual who never falls ill
- B) an organism that lives 100 years and leaves two offspring, both of whom survive to reproduce
- C) a female who mates with 20 males and produces one offspring that lives to reproduce
- D) an organism that dies after five days of life but leaves 10 offspring, all of whom survive to reproduce
- E) a male who mates with 20 females and fathers one offspring

Answer: D

17) In a hypothetical world, every 50 years people over 6 feet tall are eliminated from the population before they reproduce. Based on your knowledge of natural selection, what would you predict about how the average height of the human population will change over time?

- A) Average height will rapidly decline.
- B) Average height will rapidly increase.
- C) Average height will gradually decline.
- D) Average height will remain unchanged.
- E) Average height will gradually increase.

Answer: C

- 18) Through time, the lineage that led to modern whales shows a change from four-limbed land animals to aquatic animals with two limbs that function as flippers. Which of the following explains this change?
- A) natural selection
 - B) creationism
 - C) feedback inhibition
 - D) the hierarchy of the biological organization of life
 - E) natural philosophy

Answer: A

- 19) Which of the following statements is *true*?
- A) The importance of fungi has led scientists to make them the whole of one domain.
 - B) All prokaryotes belong to one domain.
 - C) A kingdom can include several subgroups known as domains.
 - D) Only organisms that produce their own food belong to one of the domains.
 - E) All eukarya belong to one domain.

Answer: E

- 20) What is the name of the process by which the information in a gene directs the synthesis of a protein?
- A) post translation modification
 - B) replication
 - C) transcription
 - D) gene expression
 - E) cloning

Answer: D

- 21) Why is Darwin considered original in his thinking?
- A) He demonstrated that evolution is continuing to occur now.
 - B) He proposed the mechanism that explained how evolution takes place.
 - C) He observed that organisms produce large numbers of offspring.
 - D) He provided examples of organisms that had evolved over time.
 - E) He described the relationship between genes and evolution.

Answer: B

- 22) Darwin's finches, collected from the Galápagos Islands, illustrate which of the following?
- A) vestigial anatomic structures
 - B) adaptive radiation
 - C) ancestors from different regions
 - D) mutation frequency
 - E) the accuracy of the fossil record

Answer: B

- 23) When your body temperature rises on a hot day, the neural and hormonal mechanisms activate sweating. Evaporation of sweat leads to cooling of the body surface. What is this an example of?
- A) chemical regulation
 - B) emergent properties
 - C) chemical cycling
 - D) positive feedback regulation
 - E) negative feedback regulation

Answer: E

- 24) According to Darwinian theory, which of the following exhibits the greatest likelihood for evolutionary success?
- A) the community of organisms that is capable of living in the most nutrient-poor environment
 - B) the organism that produces its own nutrients most efficiently
 - C) the species with the longest life
 - D) the genus with members that occupy the greatest number of habitats
 - E) the individuals within a population that have the greatest reproductive success

Answer: E

- 25) Which of the following do humans and roses have in common?
- A) Both lack a membrane-bound nucleus inside their cells.
 - B) Both are multicellular.
 - C) Both are prokaryotic.
 - D) Humans and roses have nothing in common.
 - E) They are both producers.

Answer: B

- 26) Why is the theme of evolution considered to be the core theme of biology by biologists?
- A) Biologists do not subscribe to alternative models.
 - B) It is recognized as the core theme of biology by organizations such as the National Science Foundation.
 - C) It provides a framework within which all biological investigation makes sense.
 - D) Controversy about this theory provides a basis for a great deal of experimental research.
 - E) Since it cannot be proven, biologists will be able to study evolutionary possibilities for many years.

Answer: C

- 27) The method of scientific inquiry that draws conclusions from careful observation and the analysis of data is known as which of the following?
- A) deductive reasoning
 - B) hypothesis-based science
 - C) qualitative science
 - D) quantitative science
 - E) inductive reasoning

Answer: E

- 28) When applying the process of science, which of these is specifically tested?
- A) a question
 - B) an observation
 - C) a result
 - D) a prediction
 - E) a hypothesis

Answer: D

- 29) Which of the following describes a controlled experiment?
- A) The experiment proceeds at a slow pace to guarantee that the scientist can carefully observe all reactions and process all experimental data.
 - B) There are at least two groups, one of which does not receive the experimental treatment.
 - C) There is one group for which the scientist controls all variables.
 - D) The experiment is repeated many times to ensure that the results are accurate.
 - E) There are at least two groups, one differing from the other by two or more variables.

Answer: B

- 30) Why is it important that an experiment include a control group?
- A) The control group provides a reserve of experimental subjects.
 - B) The control group is the group that the researcher is in control of, the group in which the researcher predetermines the results.
 - C) A control group is required for the development of an "If...then" statement.
 - D) Without a control group, there is no basis for knowing if a particular result is due to the variable being tested.
 - E) A control group assures that an experiment will be repeatable.

Answer: D

- 31) Which of the following describes the application of scientific knowledge for some specific purpose?
- A) deductive science
 - B) inductive science
 - C) technology
 - D) anthropologic science
 - E) pure science

Answer: C

- 32) Which of the following are qualities of any good scientific hypothesis?
- I. It is testable.
 - II. It is falsifiable.
 - III. It produces quantitative data.
 - IV. It produces results that can be replicated.
- A) I only B) II only C) III only D) I and II E) III and IV

Answer: D

- 33) When a hypothesis cannot be written in an "If...then" format, what does this mean?
- A) It cannot be testable.
 - B) The hypothesizer does not have sufficient information.
 - C) It cannot be a scientific hypothesis.
 - D) It does not represent deductive reasoning.
 - E) The subject cannot be explored scientifically.

Answer: D

- 34) Which of the following is the best description of a control for an experiment?
- A) The control group is matched with the experimental group except for the one experimental variable.
 - B) The control group is kept in an unchanging environment.
 - C) Only the experimental group is tested or measured.
 - D) The control is left alone by the experimenters.
 - E) The control group is exposed to only one variable rather than several.

Answer: A

- 35) Given the cooperativity of science, which of the following is most likely to result in an investigator being intellectually looked down upon by other scientists?
- A) Spending most of a lifetime investigating a small and seemingly unimportant organism.
 - B) Making money as the result of studies in which a new medication is discovered.
 - C) Being found to have falsified or created data to better fit a hypothesis.
 - D) Doing meticulous experiments that show data that contradict what has been previously reported by the scientific community.
 - E) Getting negative results from the same set of experiments.

Answer: C

- 36) Which of these is an example of inductive reasoning?
- A) If protists are all single-celled, then they are incapable of aggregating.
 - B) If horses are always found grazing on grass, they can be only herbivores and not omnivores.
 - C) Hundreds of individuals of a species have been observed and all are photosynthetic; therefore, the species is photosynthetic.
 - D) If two species are members of the same genus, they are more alike than each of them could be to a different genus.
 - E) These organisms live in sunny parts of this area so they are able to photosynthesize.

Answer: C

- 37) In a high school laboratory, which of the following constitutes an experiment?
- I. learning to use a microscope by examining fixed specimens on slides
 - II. being able to examine swimming protists under a microscope
 - III. extracting pigments from plant leaves and separating the types of pigments for identification
 - IV. preparing root tips for examination by staining them
- A) I only
 - B) II only
 - C) III only
 - D) II and III only
 - E) II, III, and IV

Answer: C

- 38) Which of the following best describes a model organism?
- A) It is often pictured in textbooks and easy for students to imagine.
 - B) It is small, inexpensive to grow, and lives a long time.
 - C) It lends itself to many studies that are useful to beginning students.
 - D) It has been chosen for study by the earliest biologists.
 - E) It is well studied, easy to grow, and results are widely applicable.

Answer: E

- 39) Why is a scientific topic best discussed by people of varying points of view, a variety of subdisciplines, and diverse cultures?
- A) They can rectify each other's approach to make it truly scientific.
 - B) Scientists need to exchange their ideas with other disciplines and cultures so that all groups are in consensus with the course of future research.
 - C) Robust and critical discussion between diverse groups improves scientific thinking.
 - D) Scientists can explain to others that they need to work in isolation to utilize the scientific method more productively.
 - E) This is another way of making science more reproducible.

Answer: C

- 40) What does the observation that a whale's front flippers have the same bone structure as all mammalian forelimbs suggest?
- A) Whales once walked on land.
 - B) Land mammals originally came from the sea.
 - C) All mammals descended from a common ancestor.
 - D) There must have been land and aquatic ancestors that coevolved.
 - E) Whales show remarkable diversity.

Answer: C

- 41) Which of the following best describes the search for information and explanations of natural phenomena?
- A) deduction
 - B) hypothesis formation
 - C) non-scientific interest
 - D) curiosity
 - E) scientific inquiry

Answer: E

- 42) When you conduct research at a community level, you are generally interested in which major biological theme?
- A) New properties emerge at each level in the biological hierarchy.
 - B) Life requires energy transfer and transformation.
 - C) Structure and function are correlated at all levels of biological organization.
 - D) Evolution accounts for the unity of diversity of life.
 - E) Organisms interact with other organisms and the physical environment.

Answer: E

- 43) Which of the following theme(s) does research into evolutionary adaptation consider?
- A) Organisms interact with other organisms and the physical environment.
 - B) The continuity of life is based on heritable information in the form of DNA.
 - C) Structure and function are correlated at all levels of biological organization.
 - D) All of the above are considered in this form of research.
 - E) None of the above apply to evolution.

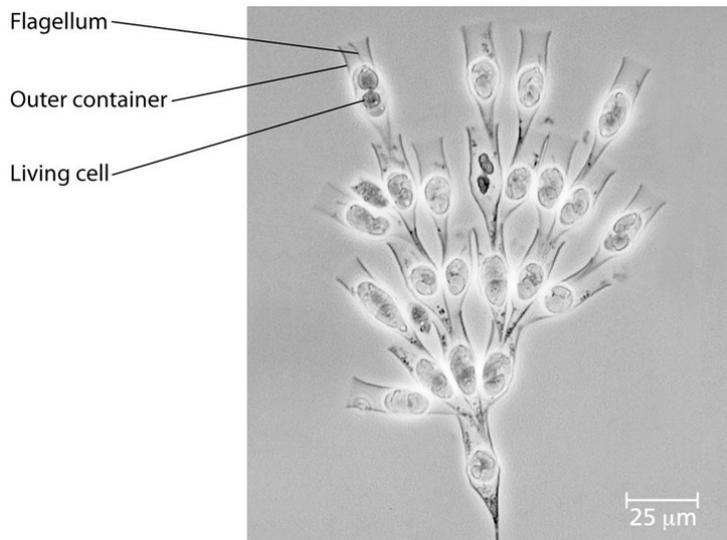
Answer: D

- 44) In what sense does the comment "the whole is greater than the sum of its parts" apply to biology?
- A) As we move up through biological levels, the systems become more complex.
 - B) This statement has nothing to do with biology.
 - C) Cooperation and interdisciplinary research allows us to understand systems rather than just parts of the system.
 - D) As we move up through biological levels, novel properties emerge that could not be identified at lower levels.
 - E) The basic unit in biological systems is cells and they must be combined to make more complex organisms.

Answer: D

Use the following information to answer the questions below.

Golden algae are a group of photosynthetic protists whose colour is due to carotenoid pigments: yellow and brown. A group of students was given a significant sample of golden algae (*Dinobryon*); this algae is colonial and has flagella. Their instructions for the project were to design two or more experiments that could be done with these organisms.



- 45) Since these organisms are protists, which of these characteristics could the students assume to be *true*?
- A) They have membrane-bound organelles.
 - B) Each has a single circular molecule of DNA.
 - C) The organisms are photosynthetic.
 - D) They are single-celled.
 - E) All of them are marine.

Answer: A

- 46) The students decide that for one of their experiments, they want to see whether the organisms can photosynthesize. Which of the following is the best hypothesis?
- A) If the *Dinobryon* can live without exposure to light for > 5 days, they must be able to photosynthesize.
 - B) If the *Dinobryon* photosynthesize, they must need no other minerals or nutrients and will be able to live in distilled water and light alone.
 - C) If the *Dinobryon* are kept in the dark, one-half will be expected to die in 5 days.
 - D) If the *Dinobryon* are able to photosynthesize, the students should be able to extract photosynthetic pigments.
 - E) If the *Dinobryon* can live > 5 days without added food, they must be able to photosynthesize.

Answer: D

- 47) For their second experiment, the students want to know whether the *Dinobryon* have to live in colonies or can be free living. How might they proceed?
- A) Observe whether only specialized cells are able to divide to produce new colonies.
 - B) Divide a sample into single cells and observe them.
 - C) Observe each day to see whether new organisms are ever reproduced as single cells.
 - D) Divide a sample into single cells and see whether they come back together.
 - E) Divide a sample into single cells and measure the length of time they remain this way.

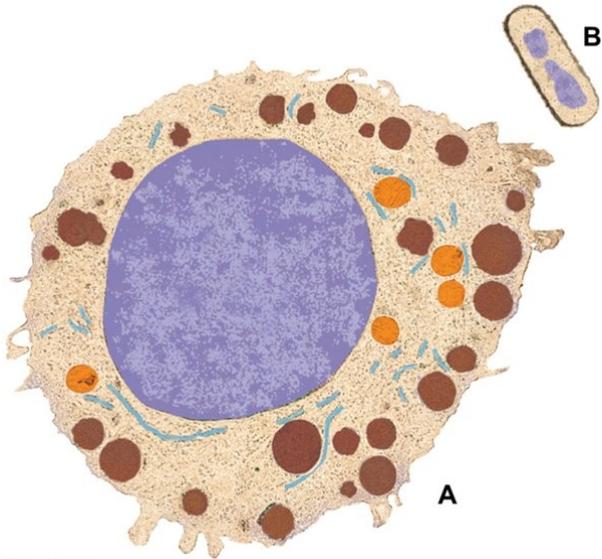
Answer: E

48) The students plan to gather data from the project. Which of the following would be the best way to present what they gather from experimental groups as opposed to controls?

- A) measuring the number of new colonies formed during every 12-hour period
- B) measuring the dry weight of all new colonies in grams
- C) counting the number of new colonies after a week
- D) qualitatively, noting colour, size, and so on
- E) measuring the size of each new colony in millimetres (mm) of length

Answer: A

Use the following information to answer the questions below.



49) What do the two cells pictured above have in common?

- A) organelles used in photosynthesis
- B) cell walls
- C) The two cells are the smallest unit of a complex organism.
- D) membranes surrounding their DNA
- E) membranes separating them from their surroundings

Answer: E

50) Figure B is which of the following?

- A) prokaryote
- B) protist
- C) eukaryote
- D) chloroplast
- E) mitochondrion

Answer: A

51) How do we know that Figure A is an eukaryote?

- A) It is larger than B.
- B) A membrane surrounds it completely.
- C) It is not perfectly smooth.
- D) Internal membrane-bound structures are visible.
- E) It has no defined nucleus.

Answer: D

52) Which of the following best describes all the living things in a particular area?

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

Answer: D

The following is a list of biology themes discussed in Chapter 1. Use them to answer the questions below.

- I. New properties emerge at each level in the biological hierarchy.
- II. Organisms interact with other organisms and the physical environment.
- III. Life requires energy transfer and transformation.
- IV. Structure and function are correlated at all levels of biological organization.
- V. Cells are an organism's basic units of structure and function.
- VI. The continuity of life is based on heritable information in the form of DNA.
- VII. Feedback mechanisms regulate biological systems.
- VIII. Evolution accounts for the unity and diversity of life.

53) Which theme(s) is/are best illustrated by an experiment in which a biologist seeks a medication that will inhibit pain responses in a cancer patient?

- A) V and VIII B) II C) VI and VII D) VII E) III and V

Answer: D

54) Which theme(s) is/are best illustrated by a group of investigators who are trying to classify and explain the ecology of the community living within a specific region of prairie grassland?

- A) II only B) VIII only C) I and II D) I only E) IV and VI

Answer: C

55) Which theme(s) is/are illustrated when a group of students is trying to establish which phase of cell division in root tips happens most quickly?

- A) IV only
- B) VII only
- C) IV, V, and VI
- D) V only
- E) V, VI, and VII

Answer: C

56) Which theme(s) is/are illustrated when a biology class is comparing the rates of photosynthesis between leaves of a flowering plant species (*Gerbera jamesonii*) and a species of fern (*Polypodium polypodioides*)?

- A) I only B) II only C) I and III D) I and VII E) I, III, and V

Answer: E

Use the following information to answer the questions below.

You are studying photosynthesis and its overall function and purpose. You choose to use several aquatic plants of the same species and divide them into two tanks. One tank is under a low light regime and the other a high light regime. You grow them in these conditions for several weeks and make observations.

- 57) After several weeks you notice that the plants in high light are larger (grew more) and there are more air bubbles in the tank than in the low light tank. Which of the following is the most logical conclusion?
- A) You need to do more research to fully understand what could be happening.
 - B) More air in the tank has helped the plants to grow.
 - C) Something in the low light tank must be stopping growth.
 - D) The difference in light must have an influence on growth.
 - E) You didn't do the study properly and put larger plants in one tank.

Answer: D

- 58) You are studying photosynthesis and its overall function and purpose. You choose to use several aquatic plants of the same species and divide them into two tanks. One tank is under a low light regime and the other a high light regime. You grow them in these conditions for several weeks and make observations. What is the logic above an example of?
- A) deductive reasoning
 - B) inductive reasoning
 - C) making a prediction
 - D) poor science
 - E) collecting data

Answer: B

- 59) You are studying photosynthesis and its overall function and purpose. You choose to use several aquatic plants of the same species and divide them into two tanks. One tank is under a low light regime and the other a high light regime. You grow them in these conditions for several weeks and make observations. This conclusion can be considered which of the following?
- A) natural selection
 - B) mistake
 - C) hypothesis
 - D) theory
 - E) prediction

Answer: C

- 60) The plant you chose has never been studied before. Perhaps you could have chosen a plant that many researchers are working on so that you could use and add to the body of knowledge about that organism. What is this type of species known as?
- A) model organism
 - B) common research organism
 - C) modified organism
 - D) shared species
 - E) logical organism; competition

Answer: A

61) All the organisms on your campus make up which of the following?

- A) a population
- B) an ecosystem
- C) a taxonomic domain
- D) an experimental group
- E) a community

Answer: E

62) Which of the following is a *correct* sequence of levels in life's hierarchy, proceeding downward from an individual animal?

- A) organ system, tissue, molecule, cell
- B) brain, organ system, nerve cell, nervous tissue
- C) nervous system, brain, nervous tissue, nerve cell
- D) organism, organ system, tissue, cell, organ
- E) organ system, nervous tissue, brain

Answer: C

63) Which of the following is *not* an observation or inference on which Darwin's theory of natural selection is based?

- A) Because of overproduction of offspring, there is competition for limited resources.
- B) Poorly adapted individuals never produce offspring.
- C) A population can become adapted to its environment over time.
- D) There is heritable variation among individuals.
- E) Individuals whose inherited characteristics best fit them to the environment will generally produce more offspring.

Answer: B

64) Which of the following is the main goal of systems biology?

- A) Understand the behaviour of entire biological systems.
- B) Speed up the technological application of scientific knowledge.
- C) Analyze genomes from different species.
- D) Build high-throughput machines for the rapid acquisition of biological data.
- E) Simplify complex problems by reducing the system into smaller, less complex units.

Answer: A

65) Why are protists and bacteria grouped into different domains?

- A) Because bacteria are not made of cells.
- B) Because protists are photosynthetic.
- C) Because protists eat bacteria.
- D) Because protists have a membrane-bounded nucleus, which bacterial cells lack.
- E) Because bacteria decompose protists.

Answer: D

66) Which of the following *correctly* describes a cell?

- A) There are 5 different types of molecules within a cell.
- B) One example of a specialized tissue is a chloroplast.
- C) Cells may group together to form tissues but are not able to perform a specialized function until higher levels of structure.
- D) A cell is not able to perform all the functions of life.
- E) The cell is the fundamental unit of living organisms.

Answer: E

67) Which of the following is *true* for a controlled experiment?

- A) It is supervised by an experienced scientist.
- B) It proceeds slowly enough that a scientist can make careful records of the results.
- C) It is repeated many times to make sure the results are accurate.
- D) It keeps all variables constant.
- E) It tests experimental and control groups in parallel.

Answer: E

68) Which of the following statements best distinguishes hypotheses from theories in science?

- A) Theories are hypotheses that have been proved.
- B) Hypotheses are guesses; theories are correct answers.
- C) Theories are proved true; hypotheses are often falsified.
- D) Hypotheses and theories are essentially the same thing.
- E) Hypotheses usually are relatively narrow in scope; theories have broad explanatory power.

Answer: E

69) Which of the following is an example of qualitative data?

- A) The six pairs of robins hatched an average of three chicks.
- B) The fish swam in a zigzag motion.
- C) The plant's height is 25 centimetres (cm).
- D) The temperature decreased from 20°C to 15°C.
- E) The contents of the stomach are mixed every 20 seconds.

Answer: B

70) Which of the following best describes the logic of scientific inquiry?

- A) If my experiments are set up correctly, they will lead to a testable hypothesis.
- B) If my hypothesis is correct, I can expect certain test results.
- C) If I generate a testable hypothesis, tests and observations will support it.
- D) If my prediction is correct, it will lead to a testable hypothesis.
- E) If my observations are accurate, they will support my hypothesis.

Answer: B

71) In comparison to eukaryotes, prokaryotes are considered which of the following?

- A) larger
- B) do not have membranes
- C) are smaller
- D) have more organelles
- E) more structurally complex

Answer: C

72) Which of the following is *true* about the diversity of life?

- A) Researchers identify thousands of additional species each year.
- B) At least 500,000 fungi have been identified.
- C) More vertebrate species have been identified than plant species.
- D) Biologists have identified and named about 5 million species of organisms.
- E) Estimates of the total number of species on Earth range from 8-10 million.

Answer: A

- 73) Why are protists now placed in several groups rather than in one kingdom?
- A) Because some protists use DNA as their genetic molecule and other protists use RNA.
 - B) Because protists are the most abundant organisms on earth.
 - C) Because it was determined that some protists were more closely related to plants, animals and fungi than other protists.
 - D) Because it was discovered that there were both single and multi-cellular protists.
 - E) Because protists were discovered to be both eukaryotic and prokaryotic.

Answer: C

- 74) An organism was discovered that is 50 μm in length and eukaryotic. Which of the following categories is the organism most likely to fall into?
- A) Animalia
 - B) Bacteria
 - C) Archaea
 - D) Protist
 - E) Plantae

Answer: D

- 75) Why are cilia described as an example of unity underlying the diversity of life?
- A) Cilia are cells that function in locomotion.
 - B) Imprints of cilia have been found in the fossilized remains of prokaryotes.
 - C) Humans and *Paramecium* both share the same architecture of their cilia.
 - D) Cilia have an elaborate system of tubules.
 - E) Cilia provide motility to all the cells on which they reside.

Answer: C

- 76) What does Darwin's proposed mechanism of natural selection require?
- A) The environments must vary for natural selection to occur.
 - B) Individuals with new traits always survive for a shorter period of time.
 - C) The species' environments select for certain traits.
 - D) The environment increases the variation in a species.
 - E) Natural selection requires equal reproductive success of individuals with different traits.

Answer: C

- 77) Which of the following *correctly* describes the properties and processes of life?
- A) Organisms process energy during the course of their lives.
 - B) Life is disordered.
 - C) An organism's adaptations evolve over 2 or 3 generations.
 - D) Inherited information controls the pattern of growth but not the development of an organism.
 - E) Organisms are not able to regulate their internal environment.

Answer: A

- 78) What is the application of scientific knowledge for some specific purpose known as?
- A) inquiry
 - B) deductive science
 - C) inductive science
 - D) pure science
 - E) technology

Answer: E

- 79) Which of the following is an example of qualitative data?
- A) The contents of the stomach are mixed every 20 seconds.
 - B) The fish swam in a zigzag motion.
 - C) The six pairs of robins hatched an average of three chicks each.
 - D) The temperature decreased from 20°C to 15°C.
 - E) Fourteen colonies were resistant to antibiotics.

Answer: B

- 80) The temperature at which an alligator's egg is incubated will determine the sex of the offspring. What are the dependent and the independent variables in this experiment?
- A) The temperature and sex of the baby alligator respectively.
 - B) The size of the incubator and size of the baby alligator respectively.
 - C) The number of offspring and temperature in the incubator respectively.
 - D) There are no independent variables.
 - E) The sex of the baby alligator and temperature respectively.

Answer: E

- 81) In presenting data that result from an experiment, a group of students find that most of their measurements fall on a straight diagonal line on their graph. However, two of their data points are "outliers" and fall far to one side of the expected relationship. What should they do?
- A) Average several trials, rule out the improbable results, and do not show them in the final work.
 - B) Change the details of the experiment until they can obtain the expected results.
 - C) Show all results obtained and then try to explore the reason(s) for these outliers.
 - D) Use another groups results.
 - E) Do not show these points because clearly something went wrong in the experiment.

Answer: C