

Student name: _____

TRUE/FALSE - Write 'T' if the statement is true and 'F' if the statement is false.

1) Managing emerging diseases such as SARS is just one of the many challenges facing science today.

- ☐ true
- ☐ false

2) The development of new technologies is based on science.

- ☐ true
- ☐ false

CHECK ALL THE APPLY. Choose all options that best completes the statement or answers the question.

3) Which of the following statement(s) regarding genes

- A) Genes are made up of DNA.
- B) All cells in a multicellular organism contain the same set of genes.
- C) Humans receive their DNA/genes from either their mother or their father but not both.
- D) Variations in genes are the result of mutations.

is/are true? Select all that apply.

E) All organisms such as roses, elephants and mushrooms have the same set of genes.

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

4) The circulatory system of a whale is considered an

- A) cells.
- B) tissues.

organ system because it is composed of different

- C) organs.
- D) molecules.
- E) hearts.

5) Which of the following correctly lists the levels of biological organization from simplest to most complex?

- A) cells, organs, tissues, organ systems, organism
- B) organs, organ system, organism, cells, tissues
- C) tissues, organs, organ systems, organism, cells
- D) cells, tissues, organs, organ systems, organism

E) organ systems,
tissues, cells, organism,
organs

6) The smallest, most basic unit of life is a(n)

- A) tissue.
- B) organ.

- C) cell.
- D) species.
- E) organism.

7) Which of the following processes transforms solar energy into chemical energy?

- A) metabolism
- B) homeostasis

- C) respiration
- D) photosynthesis
- E) reproduction

8) As autumn approaches, white-tailed deer begin to accumulate a layer of body fat. This is an example of which characteristic of life?

- A) maintaining homeostasis
- B) metabolism
- C) response to the environment

- D) energy
regulation
- E) organization

9) Salmon live in both fresh water and salt water during their lives. They are born in in fresh water but

migrate out to marine waters for most of their life. Eventually, they return to the place they were born in fresh water to spawn. Changing between fresh water and salt water affects the balance of water in their body. Salmon have an internal control system called osmoregulation that restores the

- A) adaptation
- B) reproduction and development
- C) response to the environment

balance by negative feedback. This is an example of which characteristic of life?

- D) energy transformation
- E) maintaining homeostasis

10) Which of the following pairs of words is matched correctly?

- A) brain - organ
- B) neuron - tissue
- C) osteocyte - organelle

- D) gene - atom
- E) heart - organ system

11) Many insects cannot see the color red, and as a result many insect-pollinated flowers are colors other than red (e.g., purple and yellow). Flower color would be considered a(n)

- A) method for maintaining homeostasis.
- B) way to maintain metabolism.
- C) adaptation.

- D) example of energy flow.
- E) example of nutrient cycling.

12) Simon is an avid gardener who spends a lot of time caring for the plants in his garden. To minimize damage from pests from his garden, Simon uses a pesticide spray. After a few years of using the same pesticide spray, he notices that it

has become less effective. This is most likely due to

- A) evolution by natural selection.
- B) using the spray incorrectly.
- C) the plants in the garden evolving.

- D) the plants

maintaining homeostasis.

E) something else in the environment.

13) All the chemical reactions that occur in a cell are collectively called

- A) mitosis.
- B) photosynthesis.
- C) cellular respiration.
- D) meiosis.
- E) metabolism.

14) Is the following statement true or false? The only single-celled organisms are prokaryotes, such as archaeans and bacteria.

- A) true, because prokaryotes are the simplest cell form
- B) true, because all eukaryotes are multicellular
- C) false, because some eukaryotes, including protists, are single-celled
- D) false, because some prokaryotes are multicellular
- E) false, because all single-celled organisms are prokaryotes

15) The various species of honeycreepers have an assortment of different beak shapes, but all honeycreeper species have a similar size and body shape. This is an example of

- A) ascent with new traits.
- B) descent with modification.
- C) taxonomic differentiation.
- D) fixed traits.
- E) modification of adaptations.

16) Based on the evolutionary tree of the three domains, which of the following statements is true?

- A) All three domains have a common ancestor.
- B) Domain Bacteria and domain Eukarya are more closely related to each other than to domain Archaea.
- C) The Eukarya have remained the same throughout evolutionary time.

- D) All three domains are equally related to one another.
- E) The Eukarya are the common ancestor to the

three domains.

17) Which of the following can be categorized as prokaryotic?

- A) domain Eukarya
- B) kingdom Plantae
- C) kingdom Protista

- D) domain Archaea
- E) kingdom Animalia

18) Is the following statement true or false? The mountain zebra (*Equus zebra*) and the donkey (*Equus asinus*) belong to the same species.

- A) true, because they both start with *Equus*
- B) true, because they are both related to horses
- C) false, because the specific epithet is different
- D) false, because they have no similarities to each

other

- E) true, because they belong to the same genus

19) Which of the following correctly lists the classification categories from least to most inclusive?

- A) kingdom, phylum, domain, class, order family, genus, species
- B) domain, kingdom, class, order, family, phylum, genus, species
- C) species, genus, family, class, order, domain, phylum, kingdom

- D) species, genus, family, order, class, phylum, kingdom, domain
- E) phylum, species, genus, kingdom, domain, order, class, family

20) Phylum Arthropoda is broken into subgroups

which include both Arachnida (e.g., spiders) and Insecta (e.g., insects). As a result, Arachnida and Insecta most likely belong

- A) class
- B) order

to which classification category?

- C) family
- D) kingdom
- E) domain

21) Which kingdom includes both unicellular and multicellular organisms?

- A) Eukarya
- B) Bacteria

- C) Protista
- D) Fungi
- E) Plantae

22) Which of the following classification categories for humans is correct?

- A) *Homo sapiens*: binomial name
- B) *Homo*: species
- C) Fungi: kingdom

- D) *sapiens*: family
- E) Domain: Archaea

23) Eli keeps a worm bin in his basement because the worms need cooler temperatures to survive. He feeds them about one pound of kitchen scraps each week. One summer the temperatures rose above the optimal temperature for the red worms (~ 85°F) and many in his colony died. However, those that survive continued to reproduce and within six months his colony was thriving again. The following summer, unusually warm temperatures once again resulted in the basement temperatures rising above 85°F. Surprisingly, Eli noticed that only a small portion of the worm colony died.

What is the best explanation for this?

- A) After the first summer, a new species of worm

- evolved.
- B) The worms

sensed that the temperature was going to be hot in the future and adapted.

C) The worms learned how to tolerate higher temperatures.

D) The worms that survived the first summer had a higher heat tolerance and passed this trait on to their

offspring.

E) Temperature and worm survival are not related.

24) Which of the following levels of biological organization is correctly matched with an example?

A) a herd of bison - community

B) a spider - organ system

C) flowers and insects in a garden - organism

D) a rock garden with various plants and rocks of

different sizes - population

E) a desert with little water, high heat, sand, cacti, and some mammals- ecosystem

25) A biologist is studying how acid rain affects earthworm and beetle populations in a portion of Yellowstone National Park. What level of organization is she studying?

A) population

B) community

C) ecosystem

D) biosphere

E) cells

26) *Didinium* are carnivorous protists that prey on other, slower moving protists. How should *Didinium* be classified?

A) eukaryotic decomposer

B) prokaryotic consumer

C) bacterial decomposer

D) prokaryotic producer

E) eukaryotic consumer

27) Sam is studying the

interaction between porcupines, pinion pine trees, and pine bark beetles. Over the course of his study in Colorado, he observes the behaviors of 25 porcupines, records the location of 151 pinion pines, and traps 332 beetles. How many

- A) 1
- B) 3
- C) 508

populations does his study include?

- D) 151
- E) There is not enough information to answer the question.

28) Which of the following is the most inclusive level of organization?

- A) class
- B) population

- C) ecosystem
- D) species
- E) cells

29) Kevin is studying predator-prey interactions. One day he notices a spider eating a cricket caught in its web. Later that day, a bird eats the spider. How many consumers has

- A) 0
- B) 1

Kevin observed directly in this scenario? ev:

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- C) 2
- D) 3
- E) 4

30) Kevin is studying predator-prey interactions. One day he notices a spider eating a cricket caught in its web. Later that day, a bird eats the spider. How many producers are there in this scenario?

- A) 0
- B) 1

- C) 2
- D) 3
- E) 4

31) Kevin is studying predator-prey interactions. One day he notices a spider eating a cricket caught in its web. Later

- A) 0
- B) 1

that day, a bird eats the spider. How many species are involved in his study?

- C) 2
- D) 3
- E) 4

32) Kevin is studying predator-prey interactions. One day he notices a spider eating a cricket caught in its web. Later that day, a bird eats the spider. Based on the organisms involved in this study, what level of organization is he studying?

- A) population
- B) community

- C) ecosystem
- D) biosphere
- E) cells

33) Which of the following is true about ecosystems?

- A) nutrients are constantly recycled
- B) producers are a food source for both consumers and decomposers
- C) solar energy is required for photosynthesis

- D) chemicals are constantly recycled
- E) All of the above answers are true.

34) A pond ecosystem includes small water fleas which feed on submerged aquatic plants. When the water fleas die, they sink to the bottom of the pond where their dead bodies are broken down with the help of bacteria. List in order the

- A) water fleas, bacteria, aquatic plants
- B) aquatic plants, water fleas, bacteria
- C) bacteria, water fleas, aquatic plants

producer, decomposer, and consumer in this system.

- D) aquatic plants, bacteria, water fleas
- E) bacteria, aquatic plants, water fleas

35) Male amphibians, including frogs and toads, have been plagued by feminization, deformity, behavioral abnormalities and sterility. Biologists from the University of Florida investigated whether reproductive problems among populations of cane toads (*Bufo marinus*) are caused by poisons from chemicals associated with agriculture. The biologists collected local adult cane toads from more than 20 different locations. Toads were collected from areas close to agriculture, both large-scale and small-scale farms, as well as

- A) Amphibian populations are facing problems due to agricultural chemicals.
- B) Toxins are capable of causing diseases and deformities within many amphibian populations.
- C) Toads collected from suburbs had fewer deformities compared to toads collected from agricultural areas.
- D) Agricultural chemicals can cause deformities and

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- A) male toads collected from the suburbs
- B) male toads collected from areas near large-scale farms
- C) male toads collected from small-scale farms

from suburbs that are nonagricultural areas. Which of the following statements would be the best hypothesis for this study?

feminization amongst cane toads.

- E) More male toads from the large-scale agricultural areas showed signs of feminization.

agriculture, both large-scale and small-scale farms, as well as from suburbs that are nonagricultural areas. Based on this study, what is the control group?

- D) male toads collected from all the different sites
- E) female toads that were not collected

37) Male amphibians,

including frogs and toads, have been plagued by feminization, deformity, behavioral abnormalities and sterility. Biologists from the University of Florida investigated whether reproductive problems among populations of cane toads (*Bufo marinus*) are caused by poisons from chemicals associated with agriculture. The biologists collected local adult cane toads from more than 20 different locations. Toads were collected from areas close to agriculture, both large-

- A) male toads collected from the suburbs
- B) male toads collected from areas near large-scale and small-scale farms
- C) female toads collected from all the different sites
- D) male toads collected from all the different sites

38) Male amphibians, including frogs and toads, have been plagued by feminization, deformity, behavioral abnormalities and sterility. Biologists from the University of Florida investigated whether reproductive problems among populations of cane toads (*Bufo marinus*) are caused by poisons from chemicals associated with agriculture. The biologists collected local adult cane toads from more than 20 different locations. Toads were collected from areas close to

- A) *Bufo marinus*
- B) cane toad

scale and small-scale farms, as well as from suburbs that are nonagricultural areas. Based on this study, what is/are the test group(s)?

- E) male and female toads collected from areas near large-scale and small-scale farms

agriculture, both large-scale and small-scale farms, as well as from suburbs that are nonagricultural areas. In this study, what is the genus of the study animal?

- C) amphibian
- D) *Bufo*
- E) *marinus*

39) Male amphibians, including frogs and toads, have been plagued by feminization, deformity, behavioral abnormalities and sterility. Biologists from the University of Florida investigated whether reproductive

problems among populations of cane toads (*Bufo marinus*) are caused by poisons from chemicals associated with agriculture. The biologists collected local adult cane toads from more than 20 different locations. Toads were collected from areas close to agriculture, both large-scale and small-scale farms, as well as from suburbs that are nonagricultural areas. Data collected by the biologists suggested a strong correlation between feminization of male

- A) yes, the data collected during the study strongly supports their theory
- B) no, the data did not show a link between the feminization of male toads and agricultural chemicals
- C) no, the scientists were testing a hypothesis which

40) Which of the following statements is correctly matched to the step of the scientific method?

- A) Biologists suggested that 2-3 cups of coffee per day can decrease death rates among women. (Hypothesis)
- B) Leslie set up mist nets to catch bats flying over a small stream. Each bat that was caught was weighed and sexed. (Experimental design)
- C) Bethany watched butterflies feeding in a large field of wild flowers. She noticed that more butterflies approached the yellow and purple flowers than the red flowers. (Observation)

41) Robert, an aspiring scientist in a biology class, wanted to conduct a study on the effects of cigarette smoke on the web-building ability of spiders. Which of the following

- A) Robert wanted to see if his *theory* was true that cigarette smoke will influence web-building in spiders.

toads and agricultural chemicals. Is it accurate to state that the scientists had supported their theory that agricultural chemicals cause deformities?

is not the same thing as a theory

- D) yes, this was a controlled study.
- E) no, this was a controlled study.

D) A researcher reported that red-foot tortoises preferred red-colored fruits and vegetables to those that were green or white. (Conclusion)

- E) All of the above statements are correctly matched.

statements is an incorrect use of terms pertaining to the scientific method?

- B) Robert made the *observation* that spiders weave webs.

C) As a *control*, Robert had a group of spiders that were never exposed to cigarette smoke.

D) Robert examined the webs from both the control group and the test group and the *data* were recorded in a table.

E) Robert *concluded* that there was no significant

difference in the ability to weave a web under conditions of cigarette smoke compared to spiders that were not exposed.

42) Scientists were studying temperature selection amongst pregnant big brown bats. What would be the best

A) pregnant bats

B) female bats that were not pregnant

C) male bats

control group for this study?

D) juvenile male bats

E) juvenile female bats

43) Scientists were studying temperature selection among pregnant big brown bats. What would the test group be in this experiment?

A) pregnant bats

B) female bats that were not pregnant

C) male bats

D) juvenile male bats

E) juvenile female bats

44) Which of the following statement(s) is/are true with respect to scientific theory?

A) Theories are accepted explanations for how the world works.

B) The theory of evolution is considered the unifying concept in biology.

C) Theories can help scientists generate new testable hypotheses.

D) Theories are supported by many observations and experiments.

E) All of the statements about scientific theories are true.

45) Which of the following is a true statement about

A) Many extinctions are associated with climate change.

B) It is estimated that presently we are losing hundreds of species every year due to human activities.

C) It is estimated that as much as 38% of all species, including most primates, birds, and amphibians, may be in danger of extinction before the end of the century.

46) Which of the following statements inaccurately describes biodiversity?

A) Biodiversity is the total number and relative abundance of species, the variability of their genes, and the different ecosystems in which they live.

B) The biodiversity of our planet has been estimated to be around 8.7 million species.

C) The impact of human activities on biodiversity loss is one of the most significant bioethical issues that we

extinction?

D) Extinction is the death of a species or a larger taxonomic group.

E) All of the statements about extinction are true.

face today.

D) So far, approximately 6 million species have been identified and named.

E) Biologists are alarmed about the current rate of extinction.

47) Living organisms must constantly take in energy in order to power functions necessary to remain alive. All of the chemical reactions that involve energy conversions within a cell are called

A) evolution.

B) respiration.

C) photosynthesis.

D) metabolism.

E) homeostasis.

48) For metabolic processes to occur within their cells, all living organisms need to maintain homeostasis which means they need

A) to maintain

the correct internal temperature, moisture level, and acidity as well as other factors.

B) to rely on the external conditions in the environment to maintain their body temperature.

C) minute to minute and day to day fluctuations in body temperature, moisture level and acidity.

D) to eat other organisms for energy and nutrition.

E) to constantly evolve as the environment changes around them.

49) The process of _____ leads to organisms that are _____ that environment.

A) natural selection; adapted to

B) adaption; evolved for

C) homeostasis; suited to

D) natural selection; perfect for

E) adaptation; only found in

50) In general, evolutionary processes lead to organisms that

A) are perfect.

B) function well in a given environment.

C) can only survive in that one environment.

D) have a single adaptive trait.

E) become extinct.

51) In science, a theory

A) is tested by an experiment.

B) is more narrow in scope than a hypothesis.

C) encompasses many hypotheses.

D) cannot be tested.

E) is held to be an absolutely correct answer to a question.

52) The purpose of a control group in an experiment is

A) to prove the hypothesis.

B) for comparison to the other

test groups.

C) for comparison to the results of other experiments.

D) to prove the prediction.

E) to control the dependent variable.

53) Which answer choice lists the steps of the scientific method in the correct order?

A) observation, hypothesis, prediction, experiment, conclusion

B) hypothesis, observation, experiment, conclusion, predictions

C) conclusion, hypothesis, observation, experiment, predictions

D) observation, experiment, hypothesis, conclusion, prediction

E) prediction, conclusion, hypothesis, experiment, observation

54) The scientific method

A) begins with the hypothesis.

B) ends with the predictions.

C) begins with observations.

D) ends after the experiment.

E) does not require a hypothesis.

Answer Key

Test name: chapter 1

1) TRUE

2) TRUE

3) [A, B, D]

4) C

5) D

6) C

7) D

8) C

9) E

10) A

11) C

12) A

13) E

14) C

15) B

16) A

17) D

18) C

19) D

20) A

21) C

22) A

23) D

24) E

25) C

26) E

27) B

28) C

29) D

30) A

31) D

32) B

33) E

34) D

35) D

36) A

37) B

38) D

39) C

40) E

41) A

42) B

43) A

44) E

45) E

46) D

47) D

48) A

49) A

50) B

51) C

52) B

53) A

54) C