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

**TRUE/FALSE - Write 'T' if the statement is true and 'F' if the statement is false.
1)** Evolution is the genetic change in a species over time.

 ⊚ true
 ⊚ false

**2)** Some living organisms possess RNA as their only genetic material.

 ⊚ true
 ⊚ false

**MULTIPLE CHOICE - Choose the one alternative that best completes the statement or answers the question.
3)** Which group includes the simplest of organisms that do not have a nucleus?

 A) Archaea
 B) Bacteria
 C) Protista
 D) Fungi
 E) Archaea and Bacteria

**4)** Biologists study the diversity of life in many ways *except* the observation of:

 A) behavior
 B) supernatural
 C) DNA
 D) fossils

**5)** \_\_\_\_\_\_\_\_\_\_\_\_ is the process of the transmission of characteristics from parent to offspring.

 A) Movement
 B) Complexity
 C) Homeostasis
 D) Heredity
 E) Metabolism

**6)** The process of using and transforming energy is known as

 A) response to stimulation.
 B) complexity.
 C) metabolism.
 D) homeostasis.
 E) cellular organization

**7)** Choose the property that is *not* common to all living things.

 A) thought
 B) homeostasis
 C) cellular organization
 D) metabolism

**8)** All living things are able to maintain stable internal conditions, whether they are unicellular or complex, multicellular organisms. This property is called

 A) metabolism.
 B) homeostasis.
 C) heredity.
 D) cellular organization.

**9)** In a multicellular organism, different tissues that function together are grouped into

 A) organisms.
 B) cells.
 C) organs.
 D) tissues.

**10)** All the populations of a particular kind of organism are members of the same

 A) community.
 B) species.
 C) habitat.
 D) ecosystem.

**11)** The populations of all the different species in a given area make up a(n)

 A) community.
 B) habitat.
 C) ecosystem.
 D) population.

**12)** Charles Darwin used \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to illustrate the mechanisms of natural selection.

 A) artificial selection
 B) biology
 C) natural history
 D) evolution

**13)** Which of the following is *not* an underlying theme of biology?

 A) cooperation
 B) flow of energy
 C) evolution
 D) creation

**14)** The \_\_\_\_\_\_\_\_\_\_ of flowering plants and insects is responsible for much of the diversity of these groups.

 A) natural selection
 B) cooperation
 C) artificial selection
 D) natural history

**15)** Scientists employ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ reasoning when performing the scientific process.

 A) inductive
 B) deductive
 C) reductive
 D) adductive

**16)** After Joseph Farman discovered, in 1985, that an ozone hole was developing over Antarctica, scientists measured levels of chemicals in the upper atmosphere. They found a surprising concentration of ozone-destroying

 A) chlorine.
 B) helium.
 C) nitrates.
 D) mercury.

**17)** The proper order for the scientific process is

 A) predictions - experiment - observation - hypothesis.
 B) experiment - observation - predictions - hypothesis.
 C) hypothesis - observation - experiment - predictions.
 D) observation - hypothesis - predictions - experiment.

**18)** The most inclusive group in taxonomy is a

 A) population.
 B) domain.
 C) kingdom.
 D) species.

**19)** In any experiment, one must be certain to

 A) include a suitable control group.
 B) wear lab coats and safety glasses.
 C) have the hypothesis at hand.
 D) use clean glassware.

**20)** We have all heard that dietary fats are linked to higher incidences of heart disease and cancer in humans. Choose the proper hypothesis that a scientist can test.

 A) Eating more meat causes cancer.
 B) Eating a diet of lard makes you fat.
 C) Dietary fat, heart disease, and cancer are all somehow interrelated.
 D) Fat levels above 30% of calories in the diet are correlated with an increase in heart disease.

**21)** A biologist wants to test the effectiveness of a new food additive on causing growth in mice. An effective control group is one that

 A) ate a higher concentration of food additive.
 B) was kept in different conditions across the city.
 C) was fed the same ration without the food additive.
 D) ate a lower concentration of the food additive.

**22)** At the end of an experiment, a conclusion is formed based on

 A) the statistical analysis of the experiment.
 B) the general observations during the experiment.
 C) the needs of the group funding the experiment.
 D) the feelings or beliefs of the scientist conducting the experiment.

**23)** Which kingdom contains photosynthetic multicellular organisms that live on the land?

 A) Fungi
 B) Plantae
 C) Animalia
 D) Protista
 E) Archaea

**24)** Which kingdom contains nonphotosynthetic multicellular organisms that digest their food externally?

 A) Fungi
 B) Plantae
 C) Animalia
 D) Protista
 E) Archaea

**25)** Which kingdom contains nonphotosynthetic multicellular organisms that digest their food internally?

 A) Fungi
 B) Plantae
 C) Animalia
 D) Protista
 E) Archaea

**26)** All organisms possess a genetic system that is based on

 A) RNA.
 B) protein.
 C) DNA.
 D) cells.
 E) sugars.

**27)** The proper order for the hierarchy of increasing complexity is

 A) organelles - cells - molecules - tissues - organs.
 B) cells - molecules - organs - tissues - organelles.
 C) molecules - organs - cells - tissues - organelles.
 D) molecules - organelles - cells - tissues - organs.
 E) organs - organelles - cells - molecules - tissues.

**28)** Testing of a hypothesis is called a(n)

 A) control.
 B) experiment.
 C) variable.
 D) prediction.
 E) conclusion.

**29)** A scientist wants to study the effect of vitamin C on colds. He recruits 100 people with colds and gives the experimental group 1000 mg of vitamin C per day. What would be an appropriate control?

 A) Give the control group nothing.
 B) Give the control group 2000 mg of vitamin C per day.
 C) Give the control group orange juice every day.
 D) Give the control group a pill similar to vitamin C but containing sugar (a placebo).
 E) Give the control group 1000 mg of another brand of vitamin C per day.

**30)** Who is credited for discovering cells?

 A) Charles Darwin
 B) Anton van Leeuwenhoek
 C) Robert Hooke
 D) Francis Crick
 E) Joseph Farman

**31)** Who are responsible for discovering the structure of DNA?

 A) Francis Crick and James Watson
 B) Charles Darwin and Joseph Farman
 C) Anton van Leeuwenhoek and Theodor Schwann
 D) Matthias Schleiden and Theodor Schwann
 E) Theodor Schwann and Robert Hooke

**32)** In tissues, the gain of new processes and abilities that individual cells do not possess is termed \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

 A) Metabolism
 B) Homeostasis
 C) Emergent properties
 D) Heredity
 E) Growth and reproduction

**33)** You use \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ reasoning when you use general principles to explain scientific observations.

 A) inductive
 B) deductive
 C) reductive
 D) adductive

**34)** A(n) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a generally accepted scientific principle that is uniformly supported by a broad range of observations.

 A) hypothesis
 B) theory
 C) truth
 D) observation

**35)** The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ states that many forms of a gene may exist among members of a population and that those members with a form better suited to their particular habitat will tend to reproduce more successfully, and so their traits become more common in the population.

 A) Chromosomal theory of inheritance
 B) Cell theory
 C) Theory of heredity
 D) Theory of evolution

**36)** Which scientific theory states that genes are located on chromosomes?

 A) Cell theory
 B) Theory of heredity
 C) Theory of evolution
 D) Chromosomal theory of inheritance

**FILL IN THE BLANK. Write the word or phrase that best completes each statement or answers the question.
37)** The kingdom that includes mushrooms and yeasts is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**38)** All living things use energy, a property known as \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**39)** As life forms become more advanced, new properties tend to occur. Therefore, we address these properties as being \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**40)** The information that determines what an organism will be like is stored in the \_\_\_\_\_\_\_\_\_\_\_\_\_ molecule.

**41)** Cells with a similar structure and function are organized into \_\_\_\_\_\_\_\_\_\_\_\_ in the body.

**42)** The sources of the ozone-destroying contaminants in the upper atmosphere were found to be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**43)** Using general principles to explain specific observations is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ reasoning.

**44)** The method of uncovering general principles by carefully using the scientific method is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ reasoning.

**45)** A collection of related hypotheses that have been shown to be true after extensive testing can be collectively called a \_\_\_\_\_\_\_\_\_.

**46)** The process where organisms act to maintain a relatively stable internal environment is \_\_\_\_\_\_\_\_\_\_.

**47)** All organisms on earth encode their genes in strands of \_\_\_\_\_\_\_\_.

**48)** The entire set of DNA instructions that specifies a cell is called its \_\_\_\_\_\_\_\_\_\_.

**ESSAY. Write your answer in the space provided or on a separate sheet of paper.
49)** Explain why a student of biology needs to study the hierarchy of levels of organization within and among living things.

**50)** Many people think the term "theory" means someone's idea about something. Explain the scientific use of the term "theory," especially as it relates to the biological concept of evolution.

**51)** Explain the relationship between ozone depletion and rising incidence of skin cancer.

**52)** Why is the study of biology central to the understanding and solving of the world's great environmental problems?

**53)** Why is it impossible for supernatural, religious, and unexplained phenomena to be explained by biology?

**Answer Key**Test name: chapter 1

1) TRUE

Evolution is the genetic change in a species over time.

2) FALSE

All living organisms possess DNA as their genetic material.

3) E

Archaea and Bacteria are prokaryotes, the simplest organisms which lack nuclei.

4) B

Biology is the study of the diversity of life.

5) D

Heredityis the process of the transmission of characteristics from parent to offspring.

6) C

Metabolism is the process of using and transforming energy.

7) A

Thought is not one of the 5 properties of life.

8) B

Homeostasis isthe ability to maintain stable internal conditions.

9) C

In a multicellular organism, different tissues that function together are grouped into organs.

10) B

Species is the interbreeding members of all the populations of a particular kind of organism.

11) A

A community is the different populations of all the species in a given area.

12) A

Charles Darwin used artificial selection to illustrate the mechanisms of natural selection.

13) D

Creationis NOT an underlying theme of biology.

14) B

The cooperation of flowering plants and insects is responsible for much of the diversity of these groups.

15) A

Scientists employ inductive reasoning when performing the scientific process.

16) A

A high concentration of chlorine (in the form of CFCs) was linked to theozone hole was developing over Antarctica.

17) D

The order of the scientific process is:observation - hypothesis - predictions - experiment.

18) B

The most inclusive group in taxonomy is a domain.

19) A

In an experiment, a control group is required for comparison.

20) D

A testable hypothesis to test if dietary fats are linked to higher incidences of heart disease and cancer in humans is: "Fat levels above 30% of calories in the diet are correlated with an increase in heart disease."In a scientific experiment, percentthreshold helps to establish a correlation between the dependent andindependent variable.

21) C

In an experiment totest the effectiveness of a new food additive on causing growth in mice, an effective control group isfed the same ration without the food additive.

22) A

At the end of an experiment, a conclusion is formed based on the statistical analysis of the experiment.

23) B

Kingdom Plantaecontains photosynthetic multicellular organisms that live on the land.

24) A

Kingdom Fungicontains nonphotosynthetic multicellular organisms that digest their food externally.

25) C

Kingdom Animaliacontains nonphotosynthetic multicellular organisms that digest their food internally.

26) C

All organisms possess a genetic system that is based on DNA.

27) D

The proper order for the hierarchy of increasing complexity is:molecules - organelles - cells - tissues - organs.

28) B

Testing of a hypothesis is an experiment.

29) D

A scientist wants to study the effect of vitamin C on colds. He recruits 100 people with colds and gives the experimental group 1000 mg of vitamin C per day. The control groupreceives a pill similar to vitamin C but containing sugar (a placebo).

30) C

Robert Hooke is credited for discovering cells.

31) A

Francis Crick and James Watson are responsible for discovering the structure of DNA.

32) C

Emergent properties arise when individual components interact to give novel properties.

33) B

Deductive reasoning moves from general to specific conclusions.

34) B

Used in a scientific sense, a theory is a generally accepted scientific principle.

35) D

Darwin’s theory of evolution attributes the diversity of organisms to natural selection.

36) D

The chromosomal theory of inheritance states that genes are physically located on chromosomes.

37) Fungi

Kingdom Fungi includes mushrooms and yeasts.

38) metabolism

All living things use energy, a property known as metabolism.

39) emergent

As life forms become more advanced, new properties tend to occur. Therefore, we address these properties as being emergent.

40) DNA

The information that determines what an organism will be like is stored in the DNA molecule.

41) tissues

Cells with a similar structure and function are organized into tissues in the body.

42) chlorofluorocarbons

The sources of the ozone-destroying contaminants in the upper atmosphere were found to be chloroflorocarbons (CFCs).

43) deductive

Using general principles to explain specific observations is called deductive reasoning.

44) inductive

The method of uncovering general principles by carefully using the scientific method is called inductive reasoning.

45) theory

A collection of related hypotheses that have been shown to be true after extensive testing can be collectively called a theory.

46) homeostasis

The process where organisms act to maintain a relatively stable internal environment is homeostasis.

47) DNA

All organisms on earth encode their genes in strands of DNA.

48) genome

The entire set of DNA instructions that specifies a cell is called its genome.

49) All living things are made up of chemicals. An understanding of chemistry is the foundation for understanding how living things function. All living things are made up of cells. An understanding of cell function is necessary to understand how tissues work, and how it is possible for tissues to be organized into organs. Understanding the needs of individual organisms helps the student determine the workings of populations and communities.

50) A theory in biology is a collection of related hypotheses that have been repeatedly tested and have stood the test of time. The theory of evolution means that substantial evidence has been found to verify the notion that evolution has and is occurring among living organisms on earth.

51) The layer of ozone surrounding the earth shields us from the sun's harmful ultraviolet rays. The UV rays are mutagenic, triggering changes in the DNA of our skin cells, giving rise to cancer. With less ozone, more UV rays hit the earth. If we continue to sunbathe and expose our skin, cancer rates will continue climbing.

52) When people do not have knowledge of biology, they do not understand the needs of organisms or the interactions that occur within ecosystems. Without an understanding of the basics of biology, people cannot hope to understand and solve the world's environmental problems.

53) Biology, and all sciences, are based on the scientific process, which cannot be applied to supernatural, religious, and unexplained phenomena. Science examines and tests evidence; these areas have no tangible evidence for testing.