

Chapter 1 Test

Directions:

This is a 25-question test. Once you've completed it, the answer key will become available.

You may take this test only ONCE.

1) QID: 10099

One of the propositions of Darwin's theory of evolution by natural selection is "survival of the fittest." The phrase means that:

- Different individuals leave different numbers of descendants.
- Individual members of a species are not identical.
- Natural selection results in organisms that are perfectly matched to their environment.
- The fittest individuals produce large numbers of offspring.

2) QID: 12634

A good example of coevolution is the interaction of

- *Hyracotherium* and *Mesohippus*.
- *Hyracotherium* and the dominant vegetation of the time.
- the ancestral and the descendant species of the modern horse.
- dinosaurs and humans.

3) QID: 18175

Which of the following represents the correct order, from **largest to smallest**, for an individual animal according to the hierarchical structure of biological organization?

- Nervous system, nerve cell, brain, molecule
- Mitochondria, nerve cell, brain, nervous system
- Stomach, digestive system, brain, nerve cell
- Nervous system, brain, nerve cell, molecule

4) QID: 19907

Biologists use fruit flies to study genetics because fruit flies

- can't be naturally selected.
- have long life spans.
- reproduce quickly.
- are very common.

5) QID: 19910

Which of the following is an example of artificial selection?

- Disease kills most of the sheep in a farmer's flock.
- The weakest members of a herd of caribou are preyed upon.
- Pest-resistant rice is crossed with rice that is rich in protein.
- A farmer only allows apple trees to grow in his orchard.

6) QID: 24900

All of the following are characteristics of life **except**

- growth
- homeostasis
- movement
- reproduction
- energy use

7) QID: 35522

Who championed the experimental method during the late 16th and early 17th centuries?

- Albertus Magnus
- Isaac Newton
- Francis Bacon
- Roger Bacon

8) QID: 11326

The greatest period of evolutionary diversification occurred during the

- Cretaceous period.
- Carboniferous period.
- Cambrian period.
- Precambrian period.

9) QID: 11662

The oldest fossils known are

- bacteria.
- algae.
- bony fishes.
- mammals.

10) QID: 13143

The cause of the mass extinctions of marine species at the end of the Ordovician period is thought to be

- a meteorite collision.
- massive vulcanism.
- massive glaciation.
- continental collisions.

11) QID: 14579

What is the mechanism by which homologous structures arise?

- Evolutionary pressures cause structures with similar functions to arise in different species.
- When distantly related species live in similar environments, the structures that arise are also similar.
- Homologous structures arise and persist because the need for their function persists.
- Genetic inheritance determines homologous structure.

12) QID: 16720

According to the biological species concept, a species is any group of individuals that

- possess a high degree of morphological similarity
- will mate successfully to produce fertile offspring in a wild, free ranging condition.
- can mate and produce viable offspring whether the offspring is fertile or not.
- none of the above

13) QID: 747

Geographically isolated populations become separate species when

- they have been separated for ten or more generations.
- their markings become distinct.
- they are no longer able to interbreed.
- their skeletal structures become distinct.

14) QID: 28519

Which of the following is an example of adaptive radiation?

- the 13 different species of finches Darwin found on the Galapagos islands
- the new species of rhea that was found on the opposite side of the river from the older species of rhea
- the fact that dogs and coyotes can interbreed to produce fertile offspring
- the observation that small populations have a greater opportunity for genetic changes

15) QID: 969

Which of the following is **not** an example of a prezygotic isolation mechanism?

- separation of mating sites
- sterility of hybrids
- inviability of sperm in female reproductive tracts
- differences in courtship displays

16) QID: 14204

Which of the following is **not** a prezygotic barrier to reproduction?

- A male io moth is unable to detect the pheromones emitted by a female luna moth.
- A male peltoperlid (a type of stonefly) drums on a log to attract a mate. A female mosquito does not respond.
- The hybrid of two different species of the genus *Anopheles* is unable to reproduce successfully.
- The gametes of two different species of dung beetles are incompatible.

SAMPLE

17) QID: 14215

Following are four descriptions of prezygotic reproductive isolation. Place them in order of behavioral isolation, temporal isolation, mechanical isolation, and gametic isolation.

- A. A male diamondback rattlesnake cannot mate with a female New Mexico ridge nose rattlesnake because the male's hemipenes (sex organs) do not fit properly in the female.
- B. A male bower bird cannot mate with an emu for many reasons, but one is that the emu does not recognize the male bower bird's offering of a shelter he built himself.
- C. A male from one fruit fly species mates with a female from another species, but his sperm die before they fertilize the egg.
- D. The males of one turtle population are ready to mate in June, but the females of a second turtle population ended their mating season in May.

- C, A, B, D
- A, B, C, D
- B, D, A, C
- B, C, D, A

18) QID: 2526

Evidence suggests that 4.5 billion years ago the atmosphere most likely consisted of

- O₂, SO₂, N₂, CO, and NH₃.
- O₂, CO₂, N₂, CH₄, and NH₃.
- CO, O₂, CO₂, N₂, and NH₃.
- CH₄, H₂O, CO₂, N₂, and NH₃.

19) QID: 14213

A lion and tiger mate, but their offspring is sterile. This is an example of

- hybrid breakdown.
- prezygotic isolation.
- postzygotic isolation.
- disruptive gene flow.

20) QID: 14227

Which of the following is **not** an example of a postzygotic barrier?

- In crosses between certain species of orchids, the embryo fails to develop properly.
- Crossing a male of one species of fruit fly with a female of another species produces viable, fertile offspring. When the offspring are mated together, the resulting individuals are sterile.
- Crossing the Northern oriole and the Baltimore oriole results in viable offspring. The offspring are fertile and produce normal, fertile offspring that are capable of reproducing with both the Northern and Baltimore oriole.
- Mating a female horse and a male donkey results in a healthy mule, which reaches maturity. The mule is sterile.

21) QID: 1779

During the Industrial Revolution, the whitish lichen which colored the trees died, leaving the trees a brown bark color. The dark variety of the peppered moth became more able to evade predators because it blended into the darker colored trees. At the same time, the light variety became more conspicuous to predators. Given this scenario, which of the following statements is incorrect?

- As long as the area remains polluted, the white moths would become less numerous in the population.
- As long as the area remains polluted, the dark moths would become more numerous in the population.
- If the pollution problem was remedied, and the trees returned to their natural state, the dark moths would remain more numerous.
- If the pollution problem was remedied, and the trees returned to their natural state, the white moth would probably become more numerous again.

22) QID: 14207

A population of bacteria is resistant to penicillin, even though the population was not resistant to the antibiotic when it was first introduced. Which of the following explanations for this phenomenon is consistent with evolutionary theory?

- Only the individual bacteria that developed resistance to penicillin immediately after exposure were able to survive.
- Bacteria tried to adapt to the environment.
- There were probably some resistant bacteria in the population before penicillin was used.
- Individual bacteria developed resistance to penicillin and then were selected for.

23) QID: 28525

True or false?

Natural selection involves a change in the frequency of certain traits in a population over time.

- true
- false

24) QID: 2830

Many scientists believe that the formation of life from abiotic substances could not occur on modern Earth. The best explanation is that

- there are no hot surfaces on which weak solutions of organic molecules would polymerize.
- the visible light energy present in the early atmosphere was much higher than it is today.
- pollution present in today's atmosphere prevents the organisms from being generated.
- the oxidizing atmosphere present today is not conducive to the synthesis of complex organic molecules.

25) QID: 2931

The first person to obtain indirect evidence that organic molecules could have formed on early Earth was

- Oparin.
- Fox.
- Miller.
- Haldane.

SAMPLE

26) QID: 3032

To simulate the atmosphere that was thought to have been present in early Earth, Stanley Miller and Harold Urey used an apparatus with an atmosphere containing

- oxygen, hydrogen, and nitrogen.
- hydrogen, ammonia, methane, and water vapor.
- hydrogen, ammonia, oxygen, and carbon dioxide.
- hydrogen, water, methane, and oxygen.

27) QID: 13639

It is thought that life originated approximately

- 3.8 billion years ago.
- four billion years ago.
- sixty-five million years ago.
- 2.5 billion years ago.

28) QID: 14582

According to most ideas about the earliest atmosphere on Earth, all of the following gases were present **except**

- CO₂
- O₂
- NH₃
- H₂S

29) QID: 12214

Archaeopteryx is a transition fossil that has characteristics of both

- birds and reptiles.
- birds and mammals.
- fish and reptiles.
- fish and mammals.

30) QID: 14552

Which of the following is evolutionary evidence that whales and dolphins descended from land-dwelling mammals?

- There is no such evidence because whales and dolphins descended directly from land-dwelling reptiles.
- Their diets are much like that of land-dwelling mammals.
- Transition fossils show the presence of leglike structures, pointing to the possibility that the ancestors of whale and dolphins once lived on land.
- They communicate with one another in ways very similar to those of land-dwelling mammals.

31) QID: 3234

Coacervate drops are important to understanding life's origins because coacervates

- are able to reproduce independently.
- are able to absorb substrates from the environment and release products of chemical reactions.
- are surrounded by a lipid membrane.
- are formed only under harsh environmental conditions.

32) QID: 12927

Liposomes are

- a collection of molecules surrounded by a water shell.
- a shell of proteins surrounding water and other molecules that is selectively permeable to water.
- a collection of lipids surrounded by a polysaccharide shell.
- a collection of molecules surrounded by a lipid shell.

33) QID: 12930

What is a heterotroph?

- an organism that obtains energy by taking in food and processing it
- an organism that can use the sun as an energy source
- a carnivore
- a group of molecules that divides when it reaches a certain size

34) QID: 3554

A ribozyme is

- an enzyme that synthesizes RNA.
- an RNA molecule that can catalyze chemical reactions.
- a protein that synthesizes the polysaccharide ribose.
- a theoretical molecule that is thought to have once existed.

35) QID: 3770

One reason RNA is thought to have been the first genetic material is because

- RNA is simpler than DNA.
- RNA is more stable than DNA.
- RNA can act as a catalyst.
- RNA was produced in the Miller/Urey experiment, while DNA was not.

SAMPLE

36) QID: 14619

Which of the following may not have been required at the beginnings of life on earth?

- carbon-containing molecules
- polymerization
- DNA
- aggregation of molecules

37) QID: 3872

Oxygen in the atmosphere most likely came from

- the use of carbon dioxide as a carbon source.
- the oxidation of glucose for energy.
- thermal vents in the ocean floor.
- the breakdown of ozone in the atmosphere.

38) QID: 4185

In the five-kingdom system, bacteria are assigned to kingdom

- Monera.
- Protista.
- Animalia.
- Archaea.

SAMPLE

39) QID: 4509

Which of the following lists the levels of classification in increasingly broad categories?

- genus, species, family, order, class, phylum, kingdom
- kingdom, phylum, class, order, family, genus, species
- species, genus, family, order, class, phylum, kingdom
- species, genus, order, family, class, kingdom, phylum

40) QID: 4842

The move towards a three-domain system reflects

- A means of classifying prokaryotes that more accurately reflects evolutionary history.
- A means of classifying fungi that more accurately reflects evolutionary history.
- A means of classifying plants that more accurately reflects evolutionary history.
- Both answer choices A and C are correct.