

Name: _____ Class: _____ Date: _____

ID: A

Natural Selection Common Assessment

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- _____ 1. A man treated his home with a pesticide that kills roaches. The first application of the pesticide killed 92% of the roaches. Two months later he applied the pesticide to his home again, but the second application killed only 65% of the roaches. What would best explain the decrease in the effectiveness of the pesticide?
 - a. Once roaches learned how to fight the pesticide, they taught others.
 - b. The pesticide is effective only against mature roaches.
 - c. The surviving roaches were naturally resistant to the pesticide, and that resistance was inherited by their offspring.
 - d. The pesticide caused some of the roaches' digestive systems to mutate and metabolize the pesticide.

- _____ 2. According to the theory of natural selection, genes responsible for new traits that are beneficial to the survival of a species in a particular environment will usually
 - a. not change in frequency
 - b. increase in frequency
 - c. decrease gradually in frequency
 - d. decrease suddenly in frequency

- _____ 3. The myxoma virus was used to control an overpopulation of European rabbits in Australia. When first introduced in the mid-1900s, the virus greatly reduced the European rabbit population. Today the virus is not an effective control of the European rabbit population. Fewer European rabbits are affected by the virus today because they have —
 - a. developed resistance to the virus
 - b. learned to avoid the virus
 - c. undergone a change in diet
 - d. moved away from infected areas

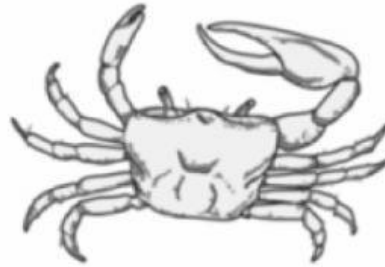
- _____ 4. Which statement best describes a current understanding of natural selection?
 - a. New mutations of genetic material are due to natural selection.
 - b. Natural selection influences the frequency of an adaptation in a population.
 - c. Changes in the gene frequencies due to natural selection have little effect on the evolution of species.
 - d. Natural selection has been discarded as an important concept in evolution.

Name: _____

ID: A

5. Male fiddler crabs attract females by quickly waving their large front claw. If a claw is lost in a fight or accident, they quickly grow a hollow claw of equal length. Because the new claw is lighter, they can wave it faster. A male fiddler crab is shown below.

MALE FIDDLER CRAB



The new claw probably helps the male fiddler crab to

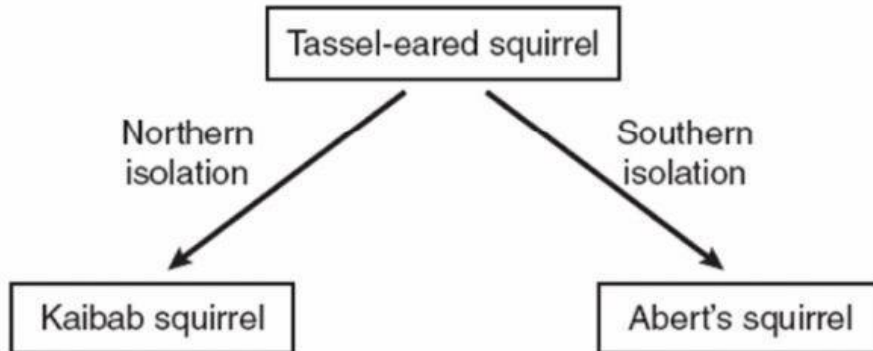
- | | |
|------------------------------|----------------------------|
| a. successfully reproduce | c. fight more successfully |
| b. evolve into a new species | d. maintain homeostasis |

6. Variety within a species is most likely to result from which situation?
- sex-specific coloring differences
 - the extinction of competing species over a broad range of habitats
 - adaptations to local environmental characteristics by isolated populations of the species
 - severe weather conditions that might occur, such as hurricanes or blizzards

Name: _____

ID: A

About 10,000 years ago two populations of tassel-eared squirrels were separated from each other. Today these squirrels are so different that they are unable to interbreed when brought together.



7. Which of the following explains this phenomenon shown above?
- Predation
 - Speciation
 - Competition
 - Extinction
8. *Odontomachus bauri* is a species of ant that has a trap jaw that shuts rapidly. This jaw system evolved from basic mouth parts that all ants have, but the jaw is longer, the joint is a different shape, and the muscles are larger.

Which of the following statements best explains why this trap-jaw trait evolved?

- The trap jaw allows the ants to eat only one kind of food.
 - The trap jaw is the ants' only means of species recognition.
 - The trap jaw increases the ants' chances of survival and reproduction.
 - The trap jaw increases the ants' body mass.
9. During the fall reproductive season, the belly of a male brook trout becomes bright orange. The orange belly provides some camouflage and helps attract females.

This trait evolved in brook trout because, compared to males with pale bellies, males with bright orange bellies are more likely to

- mate with other species of fish.
- fertilize eggs to produce offspring.
- be eaten by predators.
- live in good habitats.

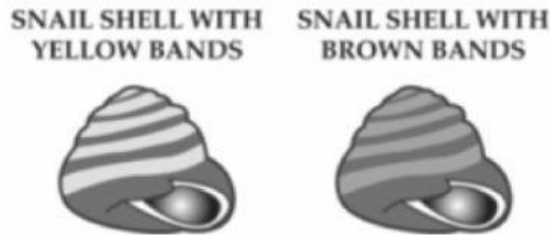
Name: _____

ID: A

- _____ 10. The diet of white-tailed deer consists primarily of shrubs. Sika are another species of deer that eat both grasses and shrubs. After an extended drought period, why might the sika population be favored over the white-tailed deer population?
- Sika require less food than do the white-tailed deer.
 - Sika have fewer food sources than do the white-tailed deer.
 - Sika have more food sources than do the white-tailed deer.
 - Sika require more water than do the white-tailed deer.
- _____ 11. *C. reinhardtii* is a species of unicellular green algae that primarily produce energy for growth through photosynthesis. However, when necessary, they can also produce energy from a carbon source, which allows them to grow in total darkness. A scientist grows a population of this algae in the dark and finds that after 600 generations, the algae population now grows better in the dark than in the light.

Which statement best explains what has happened to the cells in the algae population?

- The cells that were better adapted to growing in the light got smaller in size.
 - The cells that were better adapted to growing in the dark reproduced more.
 - They became contaminated with a species of algae that grow only in the dark.
 - They evolved into a different species that can grow only in the dark.
- _____ 12. A population of land snails colonized a field of light-colored grasses. At first, the population contained two types of snails, one with brown bands on their shells and another with yellow bands on their shells, as shown in the figure below. After 10 years, most of the snails had shells with yellow bands.



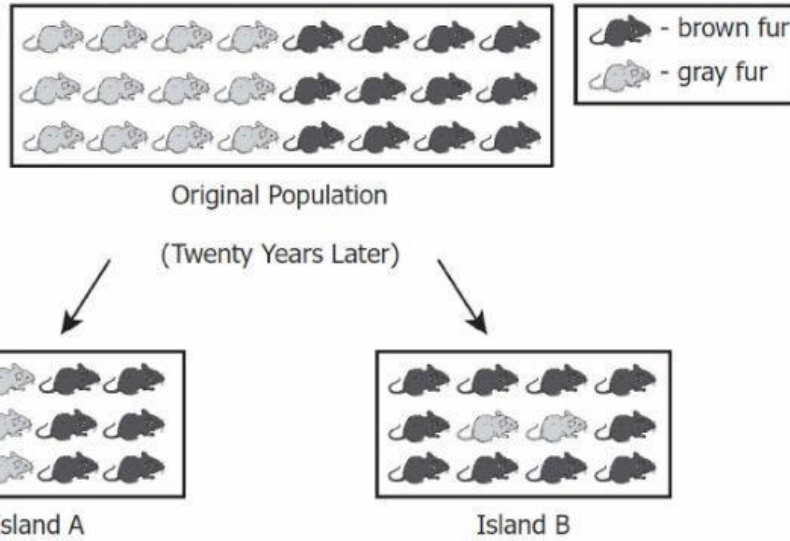
What is the most likely reason that there are more yellow-banded snails present in the grassland?

- The yellow-banded snails were infected more often by parasites.
- The yellow-banded snails were too slow to escape from predators.
- The yellow-banded snails were better at acquiring food.
- The yellow-banded snails were less visible to predators.

Name: _____

ID: A

A Population of Mice



13.

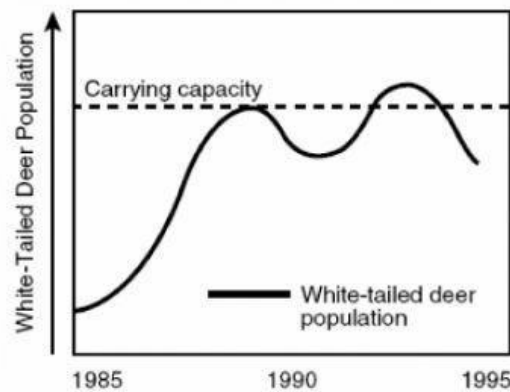
A population of mice is evenly divided into two groups, and each group is placed on an isolated island with no existing mouse population. Which statement best explains the difference in the mouse populations on Island A and Island B at the end of the 20 years?

- More brown mice were in the half of the original population that was sent to Island B than in the group sent to Island A.
- Conditions on Island B favored the brown-furred individuals, while both fur colors were evenly advantaged on Island A.
- The recapturing of mice on Island A and Island B was done differently.
- On Island A, the allele for gray fur was dominant, while on Island B, the allele for brown fur was dominant.

Name: _____

ID: A

14.



Why does the white-tailed deer population drop when the carrying capacity is exceeded?

- Resources are too low to support the population.
- The height of edible plants exceeds the height of the deer.
- Competition by other animals is greatly reduced.
- Weather changes reduce the deer population.

15. Use the pictures below to answer the following question.



hover fly



honey bee

A hover fly looks like a honey bee. Which statement best explains how this adaptation helps the hover fly survive?

- Looking like a honey bee allows the hover fly to collect more pollen.
- Looking like a honey bee keeps other animals away from the hover fly's food.
- Looking like a honey bee allows the hover fly to blend with its environment.
- Looking like a honey bee keeps some predators from trying to eat the hover fly.

Name: _____

ID: A

____ 16.

Plant Characteristics

- Grows in clusters and low to the ground
- Able to grow under a layer of snow
- Carries out photosynthesis at temperatures below freezing
- Flowers very quickly and briefly during summer
- Produces small, moisture-retaining leaves

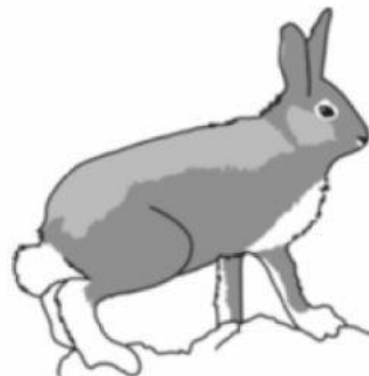
The box lists some characteristics of a plant that has adapted to conditions in its environment. To which type of environment is the plant best adapted?

- | | |
|--------------|----------------|
| a. Grassland | c. Rain forest |
| b. Tundra | d. Desert |

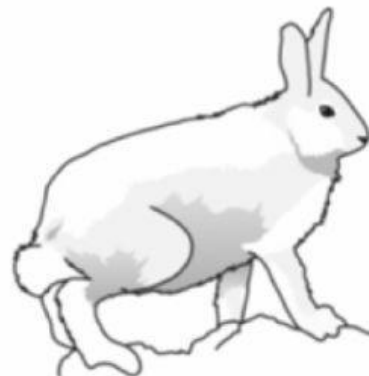
____ 17. Which of the following examples best illustrates the process of evolution by natural selection?

- a. A person with asthma has trouble breathing.
- b. A man and a woman have 10 children over the course of their lifetime.
- c. A population becomes immune to a lethal disease over many generations.
- d. A group of species has common DNA sequences.

____ 18. The pictures below show the change in the fur of an arctic hare from summer to winter.



Fur in summer



Fur in winter

Which of the following statement best describes how this change helps arctic hares?

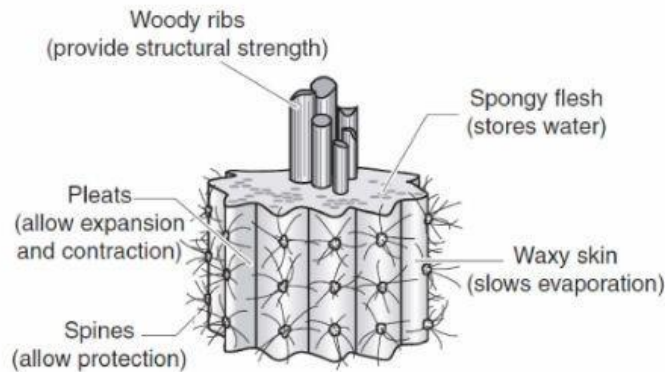
- a. It helps them move on slippery ice.
- b. It protects their eyes from sunlight.
- c. It makes them less visible to predators.
- d. It lowers their body temperature.

Name: _____

ID: A

- ____ 19. When a species includes organisms with a wide variety of traits, it is most likely that this species will have
- less success competing for resources
 - a greater change to survive if environmental conditions suddenly change
 - limitless supplies of important resources, such as food and water
 - a high proportion of individuals immune to genetic diseases
- ____ 20. Major natural events, such as volcanic eruptions, significantly change the environmental conditions of the areas where the events occur. What happens to local populations that are unable to adapt to the new conditions or to move to other areas?
- They develop a scavenger lifestyle until conditions change.
 - They undergo rapid mutations.
 - They become extinct.
 - They interbreed with the populations of other species that have remained there.

Cross Section of a Plant Trunk



- ____ 21. The picture above shows a certain plant's adaptations. In which environment would these adaptations be most beneficial?
- Desert region
 - Tropical forest
 - Coastal area
 - Northern tundra
- ____ 22. A scientist discovers several varieties of crickets living in different habitats on an island. The crickets were similar except for their colors. On the north side, most of the crickets were green. On the east side, most of the crickets were black. On the south side, most of the crickets were light brown.
- Which statement best explains why the crickets varied in color?
- Crickets intentionally changed their colors to blend in with their habitat.
 - Crickets select mates of different colors in order to have different-colored offspring.
 - Crickets moved different habitats on the island according to their color.
 - Crickets of certain colors were more likely to survive and reproduce in different habitats.