Evaluate: Biodiversity and Evolution SCA 1



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Section 1: Matching Vocabulary (10 points)

Match the word with its definition by writing the correct letter in the blank.

- 1. ___ Adaptation
- 2. ___ Fossil Record
- 3. ___ Gene Flow
- 4. ___ Natural Selection
- ___ Overproduction of Offspring

Definitions:

- **A.** A change in DNA that can introduce new traits.
- **B.** When more babies are born than can survive, creating competition.
- **C.** The process where organisms with helpful traits survive and reproduce, passing those traits on.
- **D.** A trait or behavior that helps an organism survive and reproduce in its environment.
- **E.** Movement of genes from one population to another, increasing variety.
- **F.** All the fossils discovered, which show the history of life on Earth.

Section 2: Multiple Choice (16 points)

Circle the correct answer for each question.

6. What does the fossil record show?

- A. The current population size of a species.
- B. The history of life on Earth through fossils.
- C. The locations where species live today.
- D. How species mix their genes during reproduction.

7. What is biogeography the study of?

- A. How plants and animals mix genes.
- B. Where plants and animals live and how they got there.
- C. Changes in population size.
- D. How species develop over time.

8. Which is NOT one of the key elements of natural selection?

- A. Competition for resources.
- B. Inherited variation.
- C. Overproduction of offspring.
- D. Gene flow.

9. What happens during speciation?

- A. A species disappears completely.
- B. A new species forms.
- C. A species doesn't change for a long time.
- D. Two species mix their genes.

10. What is directional selection?

- A. Natural selection favoring average traits.
- B. Natural selection favoring one extreme trait.
- C. Random changes in traits.
- D. Natural selection favoring both extremes but not the average.

11. Which is an example of anatomical homology?

- A. A bird's wing and a whale's flipper having similar bone structures.
- B. Fossils showing gradual change over time.
- C. A population's traits shifting randomly.
- D. Animals living on different continents.

12. How can environmental changes affect a species?

- A. By increasing genetic variety only.
- B. By causing increases in population, speciation, or extinction.
- C. By making every individual reproduce equally.
- D. By preventing any form of evolution.

13. What is genetic drift?

- A. A random change in traits, especially in small populations.
- B. Movement of genes between populations.
- C. The mixing of genes during reproduction.
- D. Changes in traits caused by the environment.

Section 3: Short Constructed Response (4 points each)

Answer the following questions.

14. How can fossils and homologies be used as evidence for evolution?

15. Use the data table below to answer the question.

The table shows a population of beetles living in two different environments over five generations. Green beetles blend in with the plants, while brown beetles are more visible to predators.

Generation	Environment A (mostly green plants)	Environment B (mostly brown soil)
1	50 green beetles, 50 brown beetles	50 green beetles, 50 brown beetles
2	60 green beetles, 40 brown beetles	45 green beetles, 55 brown beetles
3	70 green beetles, 30 brown beetles	40 green beetles, 60 brown beetles
4	80 green beetles, 20 brown beetles	35 green beetles, 65 brown beetles
5	90 green beetles, 10 brown beetles	30 green beetles, 70 brown beetles

Question:

Based on the table, explain how natural selection affects the populations of beetles in the two environments. What traits are favored in each environment, and why?