Name: _____

Theory of Evolution Exam

Darwin's Natural Selection Principals

~~DO NOT WRITE ON THIS EXAM!~~ write letter choice on line provided !

_____ 1. Which of the following is a good definition for the word adaptation?
   a. A change in an organism's environment.
   b. A trait that helps an organism survive and reproduce in its environment.
   c. A temperature change that can cause the extinction of plants and animals.
   d. The way in which animals obtain food.

_____ 2. Which of the following situations describes a helpful adaptation for a mole?
   a. A mole is bright and attracts the attention of predator birds.
   b. A mole is blind and cannot see underground
   c. A mole has a sensitive sense of smell to help it find food in the dark underground.
   d. A mole makes a loud scream to attract the attention of other animals.

_____ 3. Which of the following words best matches this definition: The process in which the best adapted organisms survive and pass on their traits, while those that are NOT well adapted do not survive.
   a. Natural selection
   b. Organic selection
   c. Artificial Selection
   d. Acquired trait

_____ 4. Which of the following words best matches this definition: The process where humans choose the traits that will be present in the next generation through breeding.
   a. Genetic determinism
   b. Natural selection
   c. Artificial selection
   d. Acquired trait

_____ 5. During a fierce storm, a large number of tall trees on an island are uprooted by the wind and die. Most of the trees on the island are now short trees and produce seeds that grow into short trees. What concept is shown in this example?
   a. Natural selection – the trait is selected by nature
   b. Artificial selection – the trait is selected by humans
   c. Genetic engineering
   d. Gene splicing

_____ 6. Jason, a dog breeder, decides to mate a poodle with a golden Labrador. He wants to get puppies with the curly hair of the poodle and the color of the Labrador. What concept is shown in this example?
   a. Adaptation
   b. Natural selection – the trait is selected by nature
   c. Artificial selection – the trait is selected by humans
   d. Genetic engineering

_____ 7. Which of the following is a good inference as to why wolves have the adaptation of large sharp teeth?
   a. To help them kill their prey and tear meat.
   b. To help them care for their offspring
   c. To help them groom their coats
   d. To help them attract a mate

8. Students made a model ecosystem on their school lawn. They dropped equal numbers of different colored toothpicks in the green grass to represent worms. They pretended to be birds and were given one minute to pick up as many toothpicks as they could. They picked up more red and blue tooth picks than green. What concept does this model represent?
   a. That all toothpicks can easily be seen in the grass.
   b. That animals like to eat things that are red and blue.
   c. That camouflage is an adaptation that helps animals escape predators.
   d. This activity is not like nature.

9. Birds in a desert climate survive on soft parts of cactus. Scientists observed that during a drought, many of the birds died. The ones that survived had larger beaks and were able to crack open and eat hard seeds that would ordinarily not be used. What trait would you expect to see in the next generation?
   a. Small beaks
   b. Long sharp beaks
   c. Flat spoon shaped beaks
   d. Large beaks

10. Many animals that live near the North Pole are white. Why is being white a helpful adaptation for the North Pole environment?
   a. White attracts predators
   b. White blends in with the surroundings
   c. White helps the animals to move faster
   d. White keeps the animals warm

11. _____ developed the theory of evolution by natural selection.
   (a) Alfred Russel Wallace
   (b) Charles Darwin
   (c) Jean Baptiste Lamarck
   (d) Charles Lyell

12. The voyage of the *Beagle* circled the globe. This voyage lasted
   (a) 5 months.
   (b) 2 years.
   (c) 4 years.
   (d) 5 years.

13. Aboard the *Beagle*, Darwin served as
   (a) a naturalist.
   (b) the captain.
   (c) the captain's first officer.
   (d) the ship's doctor.

14. During the voyage of the *Beagle*, Darwin
   (a) experienced an earthquake that lifted the ocean floor 9 feet.
   (b) dug up fossils of gigantic extinct mammals.
   (c) saw many plants and animals he had never seen before.
   (d) all of the above

15. Where did Darwin make some of his most important observations that helped him develop his theory?
   (a) England
   (b) the Galápagos Islands
   (c) South Africa
   (d) South America

16. One day while hiking, Maria found a rock in the wall of a canyon. In the rock, she noticed an impression of a leaf. Which answer **best** describes what Maria has found?

A. DNA

B. fossil

C. genetic evidence

D. developmental pattern

17. What is artificial selection?

A. the process by which humans breed organisms for certain characteristics

B. the process by which inherited traits in a population change over generations

C. the process by which individuals that are better adapted to their environment are more likely to survive and reproduce

D. the process through which Charles Darwin noted the differences among finches on the Galápagos Islands

18. What do fossils provide evidence for?

A. the history of life in the geologic past

B. why species became extinct in the past

C. developmental patterns of living organisms

D. the genetic similarities between living and extinct organisms

SKIP

19. What is an adaptation?

A. a group of organisms that can mate to produce fertile offspring

B. a process by which inherited traits in a population change over generations

C. a process through which individuals that are better adapted to their environment are more likely to survive and reproduce

D. a trait that improves chances of survival and reproduction for a group of individuals in a population

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20. A scientist is studying the DNA of three species. Species A and species B have DNA that is 97% similar. Species C and species A have DNA that is 95% similar. Based on the evidence, what can the scientist conclude?

A. Species B is equally related to both species A and species C.

B. Species B has a closer evolutionary relationship with species C than it does with species A.

C. Species A has a closer evolutionary relationship with species B than it does with species C.

D. Species A has a closer evolutionary relationship with species C than it does with species B.

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21. Which of these claims is **most likely** true of two species that share a recent common ancestor?

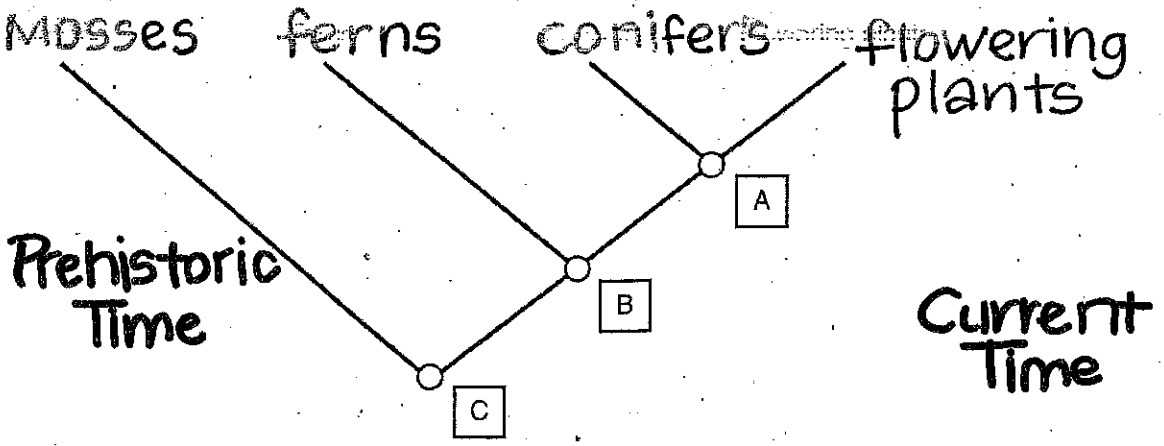
A. The two species have different developmental patterns.

B. The two species share DNA sequences.

C. The two species have similar arms and legs.

D. The ancestors of each species looked very different.

22. Cladograms are diagrams that can be used to show evolutionary relationships between different species. The diagram below is a cladogram of four plant groups.



According to the diagram, which pair of groups diverged **most** recently?

A. conifers and ferns

B. conifers and mosses

C. flowering plants and ferns

D. flowering plants and conifers

23. What is a species?

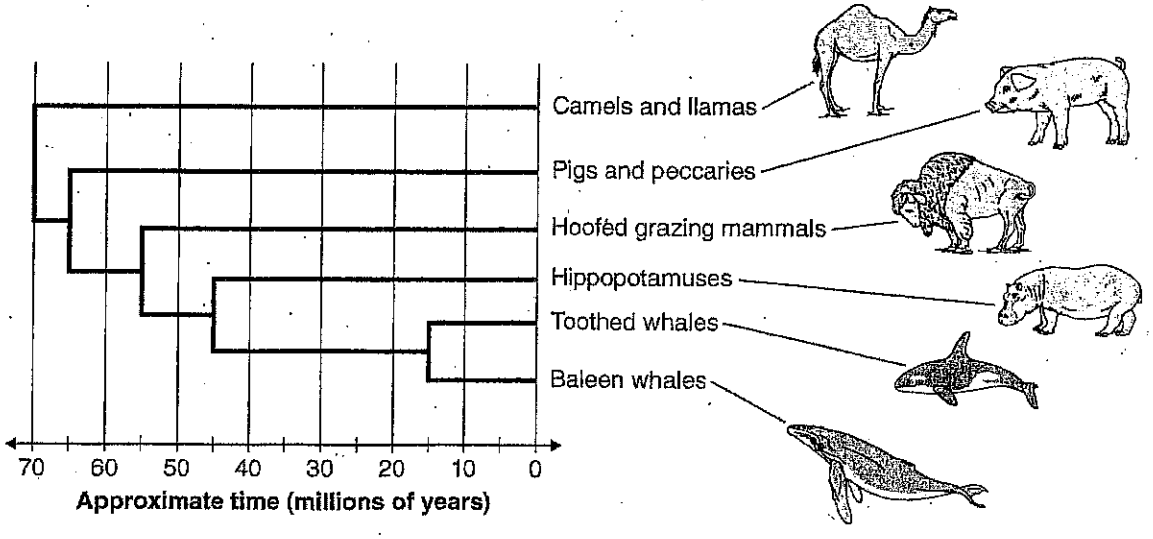
A. a group of organisms that can reproduce and have fertile offspring

B. the process by which inherited traits in a population change over generations

C. the process by which individuals that are better adapted to their environment are more likely to survive and reproduce

D. a characteristic that improves the ability of individuals in a population to survive and reproduce

24. The diagram below shows a model of the proposed relationships among some groups of mammals.



Based on the evidence, which of these organisms is **most closely** related to whales?

A. bison

B. camel

C. hippopotamus

D. pig

25. Polar bears live in the Arctic. Ice in the Arctic is melting rapidly, reducing the range in which the polar bear can live. If polar bears do not have adaptations that allow them to survive these changes, what may happen to the polar bear?

A. They may overpopulate.

B. They may become extinct.

C. They may change the environment.

D. They may become another species.

26. Ronald observes a sparrow's nest in a shrub outside his home. The table below describes his findings.

Week	Observations
1	Six eggs were laid in the nest.
3	Five eggs hatched, and one egg did not hatch.
4	One of the chicks disappeared.
7	Three of the chicks learned to fly, and another one disappeared.

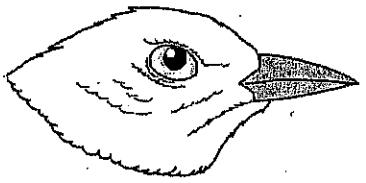
What part of natural selection did Ronald observe?

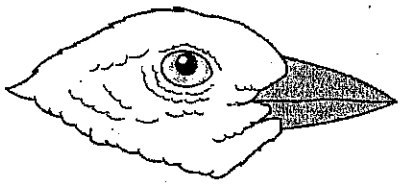
A. adaptation C. selection

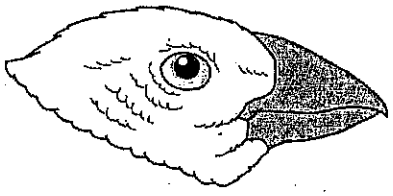
B. overproduction D. variation

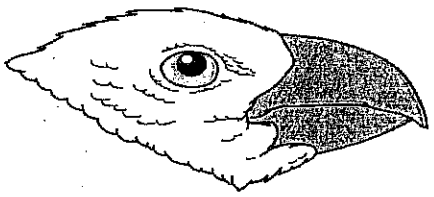
(read for answer ↓)

27. When Charles Darwin observed finches on the Galápagos Islands, he noted differences in the shapes of the birds' beaks. He observed that finches that ate insects had longer, narrower beaks than finches that crushed and ate seeds. Crushing seeds requires a larger, powerful beak. Based on this evidence, which finch shown below would **most likely** have an advantage for survival in an environment where seeds are the main source of food?

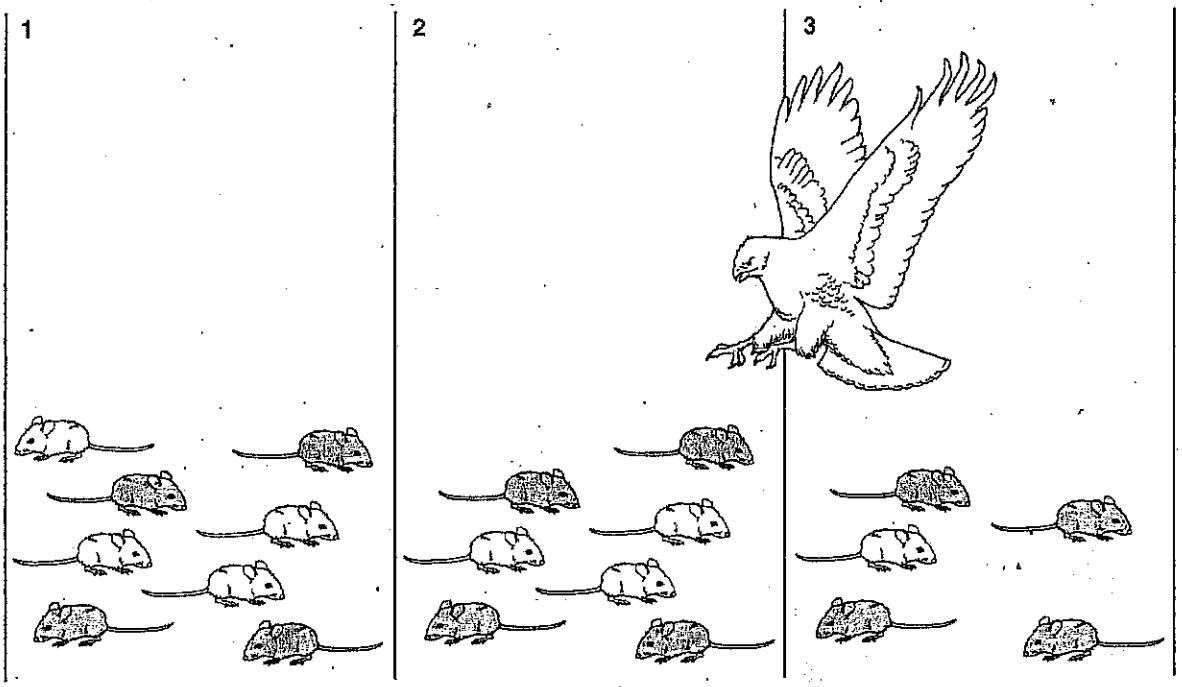
A. 

B. 

C. 

D. 

28. The diagram below shows the changes over time in a population of mice in the wild after a population of hawks has moved into their environment. The white and dark mice differ only in color.



Which claim is the **most likely** explanation for why the mouse population changed over time?

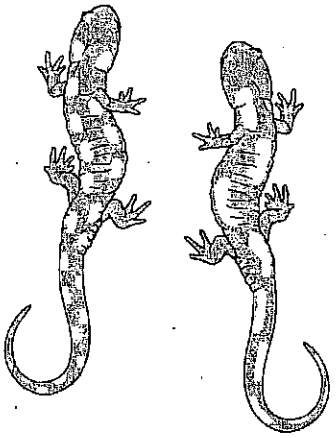
A. The hawks eat more dark mice than white mice because the dark mice taste better.

B. The white mice are able to reproduce more successfully than the dark mice do.

C. The hawks eat more white mice than dark mice because they can see the white mice more easily.

D. The hawks eat more dark mice than white mice because they can see the dark mice more easily.

29. The figure below shows two spotted salamanders. They are the same species of salamander, but they live in different areas.



Which of these terms is used to describe the difference between them?

A. overpopulation

B. population

C. extinction

D. variation

30. The table below shows characteristics of three breeds of cattle.

Characteristic	Brahmin cattle	English shorthorn cattle	Angus cattle
Quality of beef	poor	good	good
Tolerance to heat	good	poor	poor

Based on the evidence, which of the following selective breeding programs would **most likely** result in cattle that are tolerant of heat and have good-quality beef?

A. breeding Brahmin cattle with Brahmin cattle

B. breeding English shorthorn cattle with Angus cattle

C. breeding Brahmin cattle with English shorthorn cattle

D. breeding English shorthorn cattle with English shorthorn cattle

31. When farmers want two desirable traits in cows, they often breed individuals that have those traits in the hopes that the offspring will have both desirable traits. What is this practice called?

A. variation
B. adaptation
C. natural selection
D. artificial selection

32. A species of rodent lives in a moist forest climate. Over time, the climate becomes drier and more desert-like. Which of these adaptations would most likely will improve the chances that the rodent species could survive as its environment changes?

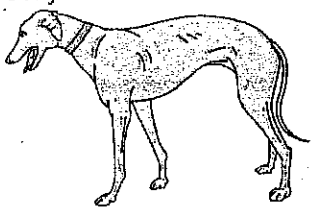
A. being able to eat plants that survive in the changed environment
B. being able to eat only one type of berry
C. living above ground in damp areas
D. having dark hair and small ears

33. At the zoo, Anya observes that individuals of a certain kangaroo species have slightly different sizes and colors. What characteristic of populations is Anya observing?

A. adaptation
B. evolution
C. selection
D. variation

34. Artificial selection of different traits in dogs has resulted in a variety of breeds. Closely related breeds sometimes look quite similar, as dog breeders have selected for similar traits. The diagram below shows a dog called a greyhound.

Greyhound



Which dog pictured below appears to share the most physical traits with the greyhound?

A. Chow Chow

B. Sheltie

C. Beagle

D. Whippet

35. Similarities in the structures of two different species provide evidence that the species evolved from a common ancestor. This type of evidence includes similar structures that have different functions. Which of the following pairs of features have a similar structure but have a different function in each organism?

A. a dolphin fin and a shark fin
B. human fingernails and monkey fingernails
C. the front leg of a cat and the wing of a bat
D. the wing of a bumble bee and the wing of a bird

36. Which of these claims **best** describes what Charles Darwin observed on the Galápagos Islands?

A. The finches on the islands ate seeds and nuts but no insects.
B. The finches on the islands were the same as the finches in Ecuador.
C. The finch population on each island was unique.
D. The finches could produce offspring only with finches from other islands.

37. According to Darwin's theory of natural selection, the individuals that tend to survive are those that have

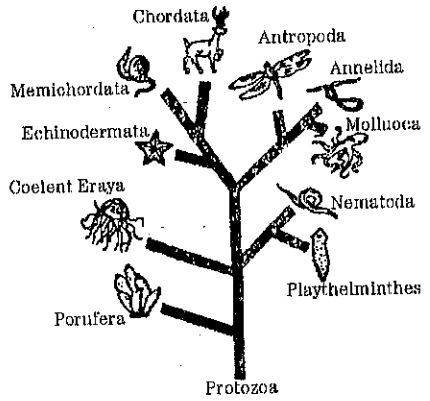
A. characteristics their parents acquired by use and disuse

B. undergone mutations

C. the smallest number of offspring

D. variations best suited to the environment

38. The diagram shown illustrates one possible scheme of evolution among various groups of organisms.



Which two groups of organisms in the diagram are shown to be most closely related?

A. Porifera and Echinodermata

B. Chordata and Platyhelminthes

C. Mollusca and Annelida

D. Arthropoda and Coelenterata

39. What is natural selection?

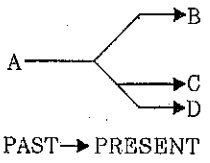
A. the process by which humans breed a species for certain traits

B. the process in which inherited traits of a population change over many generations

C. the process by which Charles Darwin noted the differences in finches while visiting the Galápagos Islands

D. the process by which individuals that are better adapted to their environment are more likely to survive and reproduce

40. In the diagram shown, *B*, *C*, and *D* represent organisms that exist in the present time and show a striking similarity to each other in their bone structure. In the diagram, letter *A* most likely represents



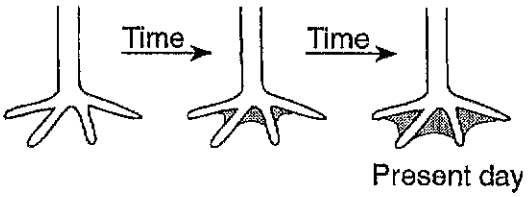
A. homologous structures

B. a common ancestor

C. an acquired characteristic

D. geographic distribution

41. The changes in foot structure in a bird population over many generations are shown in the diagram. These changes can best be explained by the concept of



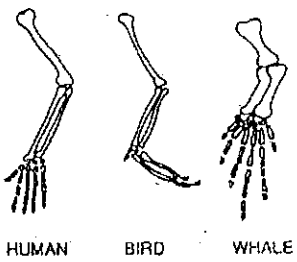
A. evolution

B. extinction

C. stable gene frequencies

D. use and disuse

42. The diagrams represent the forelimbs of three different organisms. These structures are classified as homologous because they



A. demonstrate the law of use and disuse

B. are identical in function

C. represent acquired characteristics

D. are similar in structure and origin