

- 1) Lamarck would agree with all of these statements EXCEPT
- A) boa constrictors should have vestigial hind limbs.
  - B) daily stretching will make you and your offspring more flexible.
  - C) bob-tailed cats evolved after several generations of cats had their tails bitten off.
  - D) a man who cuts off his hair will have sons who become bald.
  - E) giraffes got their long necks by stretching.
- 2) Darwin and Wallace both realized that most species produce many more offspring than is necessary to maintain a constant population. What is the fate of the excess individuals?
- A) They have evolved so that they cannot survive in their environment.
  - B) Some individuals with less favorable characteristics do not survive to reproduce.
  - C) They evolve to take advantage of natural resources.
  - D) Some individuals die arbitrarily.
  - E) They mutate and then are able to adapt to new environments.
- 3) A population of deer was threatened with overpopulation until cheetahs were imported. After a couple of years there were fewer deer but the average running speed of the deer had increased. This is an example of
- A) inheritance of acquired characteristics.
  - B) induced mutation.
  - C) genetic drift.
  - D) mutation.
  - E) natural selection.
- 4) Which of the following is NOT a trait that can evolve by natural selection?
- A) a new mutation in a deer that gives it longer legs, allowing it to run from predators more quickly
  - B) differences in the sizes of genetically identical plants exposed to different amounts of sunlight
  - C) a new form of an enzyme in a fish that allows it to break down pollutants more easily
  - D) a recessive allele in a butterfly that, in a homozygote, causes a color change
  - E) a genetically based ability to produce a chemical that attracts members of the opposite sex
- 5) Assume that it is possible to remove continuous cores of rock from the earth 6 inches in diameter and 3000 feet long. The theory of evolution by natural selection would predict what about the fossils in such cores as they are examined from top to bottom?
- A) Species change gradually, with lower fossils being more different from living species.
  - B) The number of fossils decreases but the number of species increase.
  - C) Fossil species remain constant.
  - D) Lower fossils resemble living species.
  - E) Fossils forms are arranged in random patterns.
- 6) Sea squirts and lampreys, both aquatic animals, have a perforated pharynx, a notochord at some stage of development, and a ventral heart. These similarities are BEST explained by which of these hypotheses?
- A) artificial selection
  - B) inheritance of acquired characteristics
  - C) a common ancestry
  - D) the same environmental pressures
  - E) divergent evolution
- 7) Structures (like molar teeth in vampire bats) which are homologous to important structures in other organisms but serve no purpose in the organism being considered are
- A) analogous.
  - B) mutations.
  - C) homozygous.
  - D) convergent.
  - E) vestigial.
- 8) Which of the following structures is NOT homologous to the others?
- A) alligator forelimb
  - B) bird wing
  - C) human arm
  - D) insect wing
  - E) bat wing
- 9) Some fish species found in caves have reduced eyes. These eyes are BEST described as
- A) analogous structures.
  - B) homologous structures.
  - C) vestigial structures.
  - D) fossils.
  - E) mutations.
- 10) Strong evidence for the close relatedness of vertebrates is
- A) that they all have legs.
  - B) their means of reproduction.
  - C) the similarity of their embryological stages.
  - D) they all evolved from fish.
  - E) they all possess DNA.
- 11) Cells of diverse species differ in that they do not all
- A) have DNA.
  - B) have RNA.
  - C) have ribosomes.
  - D) have ATP.
  - E) none of the above

12) Both Darwin and Wallace were influenced by Thomas Malthus' writings on

- A) population growth.
- B) uniformitarianism.
- C) genetics.
- D) evolution.
- E) natural selection.

13) Structures that have similar functions and superficially similar appearance but very different anatomy, such as the wings of insects and birds, are called \_\_\_\_\_. The similarities are due to similar environmental pressures rather than to common ancestry.

- A) analogous structures
- B) homologous structures
- C) vestigial structures
- D) mutant structures
- E) invariable structures

14) Which of the following best explains how artificial selection differs from natural selection?

- A) cold weather
- B) food shortage
- C) human choice
- D) predators
- E) crop yield

15) A key point in Darwin's explanation of evolution is that

- A) biological structures most likely inherited are those that have become better suited to the environment by their constant use.
- B) mutations that occur are those that will help future generations fit into their environments.
- C) slight variations among individuals significantly affect the chance that a given individual will survive in its environment and be able to reproduce.
- D) genes change in order to help organisms cope with problems encountered within their environments.
- E) extinction is nature's way to weed out undeserving organisms.

16) If you believe that Lasik surgery will not only improve the eye sight of the individual but also improve the eye sight of his/her descendents, then you are an advocate of the ideas of which of the following?

- A) Darwin
- B) Larmark

- C) Anaximander
- D) Aristotle
- E) Malthus

17) Thomas Malthus proposed that

- A) the food supply could multiply faster than the population.
- B) the population could multiply faster than the food supply.
- C) the food supply and population multiplied at the same rate.
- D) artificial selection was the key to evolution.
- E) natural selection was the key to evolution.

18) Monkeys of south and central America have prehensile tails, meaning that their tails can grasp objects. The tails of African and Asian monkeys are not prehensile. This is considered evidence that the South and Central American monkeys are evolutionary distinct from the African and Asian monkeys. This type of evidence would be considered:

- A) Aerodynamics
- B) Biogeography
- C) Physiology
- D) Biochemical
- E) Botanical

19) Which of the following pairs of structures is least likely to be homologous?

- A) The wing of a bat and the forelimb of a human
- B) The hemoglobin of a baboon and the hemoglobin of an ape
- C) The mitochondria of a plant and the mitochondria of an animal.
- D) The wing of a bird and the wing of an insect.
- E) The brain of a cat and the brain of a dog

20) What do fossils tell us about the nature of life over time?

- A) "Long time no see!"
- B) Living things have changed dramatically and in many sequenced directions over time.
- C) Life can get very rocky at times
- D) Virtually all known forms of life have existed together from the very beginning of life
- E) Living things are essentially the same today as they have always been.

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15. What is the evolutionary explanation for why the Irish have such fair skin?

16. What is the biological explanation for why the beaks of Galapagos Daphne finches have become larger in the mid 1970's?

17. Explain how knowledge of the sequence of nucleotides in genes or the sequence of amino acids in proteins of different provides evidence for the evolution of life on earth.

18. Choose one of the reasons many Americans give for not "believing" in evolution. Outline how a biologist might respond to convince these Americans that evolution explains the diversity of life on earth.