The World of Animals
Biology 101

Quiz 1 KEY

1. The essential criteria of science (guided by natural law, testable, tentative, falsifiable) form the hypothetico-deductive method. Deductive reasoning frees us from examining every instance in existence and allows us to reasonably assume the state of reality case by case. What statement best illustrates the use of deductive reasoning?
   a. That ant has an appetite for pizza: the colony is hungry
   b. Scorpions live in desert, therefore, they also live in California.
   c. Wasps have stingers: be careful of that one near you
   d. That bee has a stinger: be careful of the species with stripes

2. What two aspects do people find most difficult to understand about evolution?
   a. Deep time and the change in frequencies of traits in a population
   b. Gradualism and perpetual change
   c. Common descent and the multiplication of species
   d. Fossil record and mass extinctions

3. A scientific theory is different from a hypothesis, because the theory is _____.
   a. very powerful at explaining a large variety of related phenomena
   b. mere speculation
   c. a guess
   d. based on very little data

4. The theory of evolution was developed without the use of sophisticated instrumentation, relying mainly on simple observations of the natural state. What life experience helped Darwin make these observations in nature?
   a. His professional business of selectively breeding championship foxhounds.
   b. A five-year voyage on the H.M.S. Beagle, which circumnavigated the world.
   c. His development of the first vaccine for polio.
   d. Marrying his cousin Emma.

5. Evolutionary sciences (as opposed to experimental sciences) rely largely on the _____ _____.
   a. experimental method
   b. comparative method
   c. use of controls
   d. occurrence of disturbances

6. What key idea of Darwin's thinking came from his reading of an essay by T. R. Malthus?
   a. the earth is 70,000 years old
   b. struggle for existence when there is overpopulation
   c. genetic drift
   d. life comes from life

7. The best evidence for perpetual change comes from the _____.
   a. fossil record
   b. cellular structure
   c. speciation
   d. lineage of an organism

8. Galápagos finches illustrate _____, where the production of many ecologically diverse species emerge from a common ancestral stock.
   a. adaptive radiation
   b. allopatric speciation
   c. heteochrony
   d. ontogeny

9. The _____ component of evolution occurs when natural selection removes certain traits from the population due to the organism's reduced fitness.
   a. nonrandom
   b. random

10. Natural selection explains the change in the _____ in a population over time.
   a. gender composition
   b. seasonal activity
   c. daily routine
   d. frequency of a trait

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11. Speciation that results from the evolution of populations separated by geographic barriers is known as _____.
    a. adaptive radiation
    b. allopatric speciation
    c. heterochrony
    d. ontogeny

12. Variable traits are selected against when _____ is reduced.
    a. mortality
    b. survivorship
    c. fitness
    d. predation

13. Changes in the genotype effect _____.
    a. the phenotype
    b. historical relationships
    c. only the grandparents
    d. homology

14. The front flippers of a whale and front flippers of a penguin are _____ because they are morphologically similar, yet evolved independently in these two divergent groups.
    a. homologous
    b. parsimonious
    c. mysterious
    d. convergent

15. Which answer is the correct way to write a species name based on Linnaean classification?
    a. *Crotalus Atrox*
    b. Crotalus atrox
    c. *Crotalus atrox*
    d. *atrox*

16. Groups of lineages within an evolutionary tree that share a common ancestor and contain all of its descendants are said to be _____.
    a. unnatural
    b. monophyletic
    c. paraphyletic
    d. polyphyletic

17. In comparative anatomy, similarity due to a shared common ancestry is known as _____.
    a. coincidence
    b. genetics
    c. homology
    d. a random event.

18. _____ character states are newly evolved variants from a previous state.
    a. Derived
    b. Ancestral
    c. Polarity
    d. Synapomorphic

19. The _____ looks for the smallest detectable lineage: a common theme of all species concepts.
    a. biological species concept
    b. general lineage concept
    c. evolutionary species concept
    d. phylogenetic species concept

20. A taxon is _____ if it includes the most recent common ancestor of all members of a group and some but not all of the descendents.
    a. evolutionary
    b. paraphyletic
    c. polyphyletic
    d. monophyletic