2. Darwin noted the geographic distribution of species, for example, the rheas (flightless birds) are found only in __________, whereas their relatives, the emus and ostriches, are found elsewhere.
   A) Europe, Asia, and Africa  
   B) North America  
   C) Australia and Africa  
   D) South America  
   Page: 155
   Adaptations

3. Darwin noted the separation of different marine species by the Isthmus of Panama and concluded that this separation of species meant
   A) marine animals were not good at crossing dry land.  
   B) there was no good way to explain this oddity.  
   C) that the species on each side came into being where they lived.  
   D) that an external agent scattered species across the planet.  
   Page: 155
   Adaptations

4. Darwin’s observations on the common ancestry of vertebrates were based on
   A) finches and tortoises of the Galápagos Islands.  
   B) frogs and toads on island land masses.  
   C) early embryos of different animals.  
   D) various South American adaptations.  
   Pages: 156 and 157
   Adaptations

5. The common origin of toes of land-dwelling mammals, fingers of humans, and wings of bats is an example of
   A) homology.  
   B) vestigial organs.  
   C) natural selection.  
   D) origin of species.  
   Page: 157
   Adaptations

6. According to Darwin, the kinds of individuals that came to predominate as generation followed generation could be said to be
   A) members of a limited breeding population.  
   B) capable of producing more total offspring.  
   C) mainly survivors alone.  
   D) favored by natural selection.  
   Page: 158
   Adaptations
8. Mutation of __________ can profoundly modify an organism.
   A) chromosomes
   B) any part of the DNA
   C) a regulatory gene
   D) the nucleus of the cell

9. When a new species originates from two or more individuals of a preexisting species, we call this
   A) mutation.
   B) sexual recombination.
   C) speciation.
   D) interbreeding.

10. __________ is the term used to describe remarkably rapid evolutionary expansions of one or more phyla, classes, orders, or families during brief intervals of geologic time.
    A) Horizontal gene transfer
    B) Ecologic competition
    C) Evolutionary radiations
    D) Adaptive breakthroughs

11. An adaptive breakthrough for the modern hexacorals that allowed them to be able to quickly crowd out other animals that would compete for the same hard marine surfaces was
    A) dual-purpose limbs.
    B) gnawing front teeth.
    C) a symbiotic relationship with algae that live in their tissues.
    D) porous skeletons.
12. The typical pattern of evolutionary radiation, such as that seen in the record of hexacorals, is characterized by
   A) evolution that produced large-scale divergence that continued for many millions of years.
   B) evolution that produced large-scale divergence at a very early stage, but not much divergence later on.
   C) evolution that produced only new genera and species at the early stages.
   D) evolution that does not seem to affect the body plan.

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Rates of Origination

13. The evolutionary radiation of the highly distinctive adaptations of cichlid fishes in Lake Victoria is reminiscent of
   A) Jurassic hexacorals.
   B) Darwin’s tortoises and finches.
   C) Devonian fishes with paddlelike fins.
   D) certain ancestral beavers.

Page: 162 and 163
Rates of Origination

14. _________ undergo mutation without any effect on adaptation.
   A) Neutral genes
   B) Related taxa with poor fossil records
   C) Molecular clocks
   D) Amino acids

Page: 163
The Molecular Clock and Times of Origination

15. Using the molecular clock method for determining how long ago two species, A1 and A2, diverged, what would be the time estimate if species A1 differed from species A2 by 20 percent and the mutation rate were 1 percent per million years?
   A) 2 million years
   B) 10 million years
   C) 20 million years
   D) $1/20 \times 1$ million years or 50,000 years

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The Molecular Clock and Times of Origination
16. Evolutionary convergence within two or more different biological groups, for example, the evolution of __________, is convincing evidence of adaptation in biological forms.
   A) marsupial mammals of Australia and the placental mammals of other continents
   B) Asian dinosaurs and African mammals
   C) cichlid fishes of Africa and those in Australia
   D) fossil and modern hexacorals of the world
   Page: 164
   Evolutionary Convergence

17. In general, __________ is the result of particularly extreme impacts of the limiting factors that normally hold populations in check.
   A) extinction
   B) pseudoextinction
   C) adaptation
   D) speciation
   Page: 165
   Extinction

18. Over the course of geological time, the extinction rate for mammals has exceeded __________ percent per million years.
   A) 1 to 2
   B) 10 to 20
   C) 40
   D) 50
   Page: 165
   Extinction

19. The largest mass extinctions in Earth’s history rise above the level of __________ loss of then-living genera over an interval of a few million years or less.
   A) 10 to 20
   B) 40
   C) 60
   D) 80
   Page: 166
   Extinction
20. In a mass extinction, tropical species are particularly vulnerable because of
   A) complex communities, specialized ecologic requirements, and small populations.
   B) generalized ecologic requirements and small communities.
   C) the simplicity of the communities.
   D) associations with non-tropical species.
   Page: 167
   Extinction

21. Cope’s rule says that __________ tends to increase during the evolution of a group of
   animals.
   A) the number of offspring
   B) the number of males fighting for females
   C) the number of vertebrate animals
   D) body size
   Page: 167
   Evolutionary Trends

22. The ancestors of the modern-day manatee were
   A) the elephants.
   B) small, rodentlike mammals.
   C) the whales.
   D) four-legged, terrestrial mammals about 2 m long.
   Page: 168
   Evolutionary Trends

23. Dollo’s law says
   A) extinction is forever.
   B) there is a punctuational model for evolution.
   C) there is a gradualistic model for evolution.
   D) genetic change spreads rapidly through a population.
   Page: 172
   Evolutionary Trends

25. Regarding Figure 7-12, a mass extinction of most ammonites occurred __________ and
   the total mass extinction of all ammonites occurred __________.
   A) at the end of Triassic; at the end of Cretaceous
   B) at the beginning of Triassic; at the beginning of Cretaceous
   C) during Late Triassic; at or near mid-Cretaceous
   D) during Jurassic; during Cretaceous
   Page: 165
   Extinction
26. The __________ is an amphibian species that was produced when a speciation event consisting of a simple genetic change that impeded normal development of the thyroid gland occurred.
   A)  *Gryphaea*
   B)  manatee
   C)  *Amia*
   D)  axolotl

   Pages: 170–171
   Evolutionary Trends

27. __________ is the earliest recognized whale fossil.

   A)  *Indohyus*
   B)  *Pakicetus*
   C)  *Amia*
   D)  *Nannippus*

   Pages: 168–169
   Evolutionary Trends

29. The oldest known horse had four toes on each fore foot, three toes on each hind foot, and simple molar teeth. This horse (named __________) was the size of a small dog today.

   A)  *Equus*
   B)  *Hipparion*
   C)  *Mesohippus*
   D)  *Hyracotherium*

   Pages: 172–173
   Evolutionary Trends

30. Today, the rate of extinction of species surpasses the great mass extinctions of the geologic past and the largest number of extinctions can be traced to

   A)  human destruction of habitats.
   B)  human exploitation of animals.
   C)  organisms that are ecological opportunists.
   D)  vast numbers of meteorite impacts.

   Page: 167
   Extinction
Dinosaurs Under the Big Sky

What is Taphonomy?

Why might you find a jumbled mass of bones?

What would be good evidence that a predator was dining on a fossilized organism?

What is an Articulated Skeleton?

Why do paleontologists want to find articulated skeletons?

What is a bone bed, and if you found a very large bone bed, what would that imply about how the animals lived and died?

What is a coprolite?

What could you learn from examining a coprolite?

What was dinosaur skin like and how do we know?

What are gizzard stones, what are they used for and how do you identify them?