

- 1] "The smallest diagnosable cluster of individual organisms within which there is a parental pattern of ancestry and descent" defines which species concept?
a) morphological b) biological c) evolutionary d) phylogenetic
- 2] The mass extinction event responsible for the greatest number of species extinctions occurred at: a) end-Ordovician (450 mya) b) end-Permian (250 mya) c) end-Triassic (~200 mya) d) end-Cretaceous (66 mya)
- 3] Adaptive radiations can be caused by: a) polyploidy b) key innovations c) the appearance of a new resource d) b & c
- 4] The area of phylogenetic systematics that bridges population genetics and historical biogeography is referred to as: a) cladistics b) stoichiometry c) taphonomy d) phylogeography
- 5] Most species on the planet today are the result of which speciation process: a) cladogenesis b) reticulate speciation c) phyletic speciation d) a & b
- 6] Most speciation events occur via: a) allopatry b) parapatry c) sympatry d) species selection
- 7] The clade "Reptilia", exclusive of birds, comprises what kind of group?
a) monophyletic b) paraphyletic c) polyphyletic d) phylogenetic
- 8] When two taxa share one or more characters, but not due to descent from a common ancestor, these characters are considered: a) homoplastic b) homologous c) analogous d) a & c
- 9] The rapid colonization of new areas over long distances is called: a) diffusion b) migration c) emigration d) jump dispersal
- 10] A movement away from one's place of origin to a new site is referred to as: a) dispersal b) dispersion c) migration d) phoresy
- 11] The communities of specialized marine organisms that live near hydrothermal vents, occupy what major oceanic zone? a) neritic zone b) abyssal zone c) pelagic zone d) profundal zone
- 12] In the temperate grasslands, the dominant grasses are perennials, whose growth is actually stimulated by fire and grazing. The adaptation that allows for this is: a) higher silica content b) larger stomata c) apical meristems d) basal meristems

- 13] In terms of net primary productivity ($\text{g}/\text{m}^2/\text{year}$), which of the following is the least productive habitat:
a) tropical forest b) boreal forest c) swamps and marshes **d) open ocean**
- 14] The greatest number of plant species currently found on Krakatau island dispersed there via: a) the wind b) the sea **c) animals** d) they were always there in the seedbank
- 15] In Darwin's day, the occurrence of two closely related taxa on different continents was typically explained by: a) long distance dispersal b) now-submerged land bridges c) the bible **d) a & b**
- 16] A derived character that uniquely identifies a monophyletic lineage is called a: **apomorphy (or autapomorphy).**
- 17 - 18] List the four main microevolutionary processes that we discussed in the context of speciation:
mutation, genetic drift, natural selection, gene flow.
- 19] A derived character that uniquely identifies two or more lineages as a clade is called a: **synapomorphy.**
- 20] In aquatic communities, the portion characterized by having rooted vegetation is known as: **the littoral zone.**
- 21] Essentially all of the organic energy that sustains marine life is produced in a shallow layer of the ocean called **the photic zone.**
- 22] Plankton are microscopic organisms that float in the water columns of both fresh water and marine systems. Name the two major types of plankton:
phytoplankton and zooplankton.
- 23] Deep, clear, freshwater lakes with low nutrient levels and low productivity are called: **oligotrophic.**
- 24] When the geographical range of a taxon is split into two parts by the formation of a barrier, this is called **vicariance.**
- 25] Dispersing organisms must be able to withstand ecological hazards, name two of these: **competition and predation (or new parasites or diseases).**
- 26] List two "reproductive traits" of most "successful" or "good" colonizers:
asexual reproduction (vegetative, apomictic, parthenogenic), hermaphroditic, flocking, high reproductive rate, short gestation period.

- 27] Name two of the three most fundamental processes in biogeography:
evolution (speciation), extinction, dispersal .
- 28] Two mechanisms have been proposed to explain how sympatric speciation might occur; these are: **disruptive selection, chromosomal incompatibility.**
- 29] A dispersal route that selectively blocks the passage of certain forms while allowing those able to tolerate the conditions of the barrier to move through freely is called a **filter.**
- 30] In order to be considered a successful disperser, an organism must accomplish three critical things. Name two of these:
reach a new area, survive in the new area, reproduce and establish a new population.
- 31] The “branch” of systematics that attempts to reconstruct evolutionary histories is called: **phylogenetics.**
- 32] From the perspective of a biogeographer, what are the two most important pieces of information that a chronogram can provide ?
information about relationships, information on when divergences occurred.
- 33] The calibration of divergence times on a molecular phylogenetic tree can be accomplished several ways. List two of these:
a molecular clock, dated fossils, date of a biogeographic event.
- 34] For a given region, taxon cladograms for a range of organismal types, yield highly congruent taxon area cladograms that in turn yield a single general area cladogram. The most parsimonious explanation for this result is:
a vicariant event is responsible.
- 35] A population started by a few colonizing individuals usually contains only a small random sample of the alleles present in a much larger ancestral population. This is often referred to as: **founder event (or genetic bottleneck).**
- 36] Microevolution and macroevolution are fundamentally different processes that lead to different evolutionary “end products”. True / **False**
- 37] The open ocean rivals tropical rain forest in terms of total primary production. **True** / False
- 38] Seasonally intense precipitation, fires during the dry season, and seasonal grazing of migratory animals make tropical savanna’s one of the spatially and temporally heterogeneous biomes on earth. **True** / False

- 39] Organisms that can persist in highly fluctuating, unpredictable environments are more likely to survive in a new ecosystem. **True** / False
- 40] On a “per area” basis (g/square meter/year), swamps and marshes are among the most productive habitats (communities) on earth. **True** / False.
- 41] Depending on the temperature regime, sclerophyllous woodlands can be tall open forests (like Eucalyptus forests in Australia) or consist of low, shrubby vegetation (like chaparral habitats in California). True / **False.**
- 42] The arctic tundra biome often receives less precipitation annually than does many hot deserts. **True** / False
- 43] Invasive species (especially human aided introductions) are a problem but in fact, about 90% of such “colonization” attempts fail. **True** / False.
- 44] Bats tend to be found on islands because their preferred prey (flying insects) is abundant on islands. True / **False**
- 45] Genetic drift has the most impact on the speciation process in large, continuously distributed populations. True / **False**
- 46] Seven fossil teeth recently uncovered in Panama, suggest that several Iguanas rafted across a 160 km wide water gap between North and South America some 21 million years ago. True / **False**
- 47] Organisms that disperse widely always fare better than their counterparts (conspecifics) that do not. True / **False**
- 48] Barriers are a species-specific phenomena. **True** / False
- 49] Dan Janzen made the point that mountain passes in the tropics are “effectively higher” than those in temperate regions. This is because the Andes are “younger” mountains, and thus less worn down from erosion. True / **False.**
- 50] Adaptive radiations are usually rapid, recent, and restricted to island fauna. True / **False**