

1. In ecology the idea of a *community* is different from that of a *population*. How?
  - a) A community is the group of all organisms that interact and share a common space, whereas a population is composed of the members of a single species within that space.
  - b) A community is all organisms that interact and share a common space, whereas the word *population* refers to the total number of individuals of a particular species in the entire world.
  - c) A community is the total number of individuals of a particular species in the entire world, whereas the word *population* refers to all organisms that interact and share a common space.
  - d) A community is all the members of a single species that share a common space, whereas a population is composed of all organisms that interact and share a common space.
  
2. *Where* an organism lives in a community is its \_\_\_\_\_, whereas *what* the organism *does* in the community is its \_\_\_\_\_.
  - a) biome ... niche
  - b) habitat ... biome
  - c) niche ... habitat
  - d) habitat ... niche
  - e) niche ... biome
  
3. Ecology is the study of \_\_\_\_\_.
  - a) the types of organisms present in a community.
  - b) the interactions between individuals and populations in a community.
  - c) the logical movement of money within an economy.
  - d) a and b.
  - e) b and c.
  
4. A stenohaline organism is one that can tolerate \_\_\_\_\_ while a eurythermal organism is one that can tolerate \_\_\_\_\_.
  - a) a wide range of temperatures ... a wide range of salinity.
  - b) a narrow range of temperatures ... a wide range of salinity.
  - c) a narrow range of salinity ... a wide range of temperature.
  - d) a narrow range of salinity ... a narrow range of temperature.
  - e) a wide range of salinity ... a narrow range of temperature.
  
5. *Intraspecific* competition (competition between members of the same species) has a different effect on populations from that of *interspecific* competition (competition between different populations). Which of the following is true?
  - a) Intraspecific competition tends to cause a population to go extinct whereas interspecific competition tends to fine-tune populations to their environments.
  - b) Intraspecific competition tends to limit the range of a population whereas interspecific competition tends to fine-tune populations to their environments.
  - c) Intraspecific competition tends to limit the range of a population whereas interspecific competition tends to cause populations to go extinct.
  - d) Intraspecific competition tends to cause a population to go extinct whereas interspecific competition tends to limit the ranges of populations.
  - e) Intraspecific competition tends to fine-tune a population to its environment while interspecific competition tends to limit the ranges of populations.

6. A J-curve of population growth differs from an S-curve in that
- The J-curve represents population growth in an environment with no limiting factors, whereas an S-curve represents population growth in the presence of limiting factors.
  - The J-curve represents the growth of the juvenile or larval stage of the population, whereas the S-curve represents the growth of the senior cohort of the population.
  - The J-curve represents the growth of a population of predators whereas the S-curve represents the growth of a prey population.
  - The J-curve represents the growth of a prey population whereas the S-curve represents the growth of a predator population.
  - The J-curve represents the growth of a population of autotrophs whereas the S-curve represents the growth of a population of heterotrophs.
7. The carrying capacity of an ecosystem for a particular species is
- the combination of limiting factors that controls the population of that species in that particular ecosystem.
  - the number of individuals in that species that the community can support indefinitely under stable conditions.
  - the number of individuals of that species that are needed for the species not to disappear from the ecosystem.
  - the number of individuals of that species that are needed for the population to start growing according to a J-curve.
8. Organisms in a community most commonly have a \_\_\_\_\_ distribution because \_\_\_\_\_
- uniform ... this minimizes competition for resources.
  - uniform ... this maximizes the chances that at least some individuals will encounter optimal conditions for growth.
  - random ... resources are usually distributed randomly.
  - clumped ... resources are rarely distributed either uniformly or randomly, but rather in patches or clumps.
9. Which of the following is true?
- Damage to the environment by manmade or natural forces is always permanent and irreparable.
  - If a climax ecological community suffers a catastrophic change, the resulting community immediately after the change will be permanent until another catastrophe occurs.
  - If a climax ecological community suffers a catastrophic change, the resulting community will gradually change through the succession of species, eventually ending up with the original climax community.
  - If a climax ecological community suffers a catastrophic change, the resulting community will gradually change through the succession of species, with a new climax community that may be different from the original climax community.
10. Generally speaking, the rocky intertidal zone is
- rich in life, but only a few species live there.
  - rich in life, with considerable species diversity.
  - not particularly rich in life.
  - not particularly rich in life, but rich in resources like food.
  - almost devoid of life because of the severe conditions.
11. The rocky intertidal zone is a difficult place for marine organisms to live. They are exposed alternately to air and to seawater as the tide rises and falls, and waves constantly crash on them. The advantages of living in the rocky intertidal zone include all of the following *except*
- high nutrient input from the land.
  - high concentration of dissolved gases.
  - protection from physical damage due to the force of moving water.
  - a variety of habitats in a comparatively small area.

12. The diversity of life in sandy beach environments is typically much \_\_\_\_\_ than that of the rocky intertidal zone, in part because \_\_\_\_\_
- higher ... there are many more ecological niches available in a sandy beach than on a rocky shore.
  - lower ... the environment is more hostile due to (among other things) abrasion by sand particles and the difficulty of detecting food among swirling sand particles.
  - higher ... the ease of finding food in a flat sandy environment compared to that of finding food in a complex rocky environment.
  - lower ... life's a beach, then you die.
13. Which of the following is *not* true of estuarine ecosystems?
- Larvae are often abundant there.
  - Estuaries are in danger from development and pollution.
  - Very few autotrophs live there, but many heterotrophs live there.
  - Estuaries are places where saltwater and freshwater meet.
  - Organisms living in estuaries must by necessity be euryhaline.
14. The deep scattering layer (DSL) is
- a layer of hydrocarbons found deep below the seafloor, so named because it scatters sound efficiently.
  - a layer of organisms, including fish and other animals, that reflects sound from echosounders.
  - a layer that moves closer to the sea surface at dusk, then moves deeper as dawn approaches.
  - a and c above.
  - b and c above.
15. The organisms of the bathypelagic zone are characterized by
- highly productive phytoplankton and extremely fast-swimming heterotrophs.
  - phytoplankton that depend on bioluminescence for light, and heterotrophs that produce the light.
  - A variety of bioluminescent heterotrophs, but no autotrophs.
  - no autotrophs, and nothing but primary consumers among the heterotrophs.
16. Animals living on the deep seafloor typically have which of the following adaptations?
- low metabolic rate.
  - the ability to smell food from miles away.
  - the ability to sense vibrations from animals several meters away.
  - all of the above.
  - b and c.
17. Animals living on the deep seafloor enjoy which of the following advantages?
- They have very high metabolic rates.
  - Their environment is practically constant in terms of temperature.
  - Food is easy to find on the deep seafloor.
  - They are completely safe from predators.
18. The extremophiles of the kingdom *Archaea* are so named because
- they enjoy extreme sports.
  - they include the largest organisms on earth.
  - they can survive extreme environmental conditions such as temperatures as high as 750°F.
  - they have been found on Mars and possibly Jupiter.
  - their cell walls are stronger than steel.
19. Hydrothermal vents are sometimes called "black smokers" because
- the water coming out of them is rich in sooty carbon.
  - the water coming out of them is rich in inorganic sulfides and other minerals that form a black precipitate.
  - they produce black basalt and water heated to steam at 2000°C.
  - the water coming out of them is so hot it scorches the bacteria that contact it, turning them black.

20. Hydrothermal vent communities are remarkable because all the animals derive their energy directly from
- the hot water coming out of the vents.
  - the sulfides carried out of the vents by the hot water.
  - glucose produced by bacteria that get their energy from hydrogen sulfide coming from the vents.
  - the sun.
  - nuclear energy.
21. The biggest animals associated with hydrothermal vents are probably
- the extremophilic bacteria coming out of the vents in the water.
  - the chemosynthetic bacteria living all around the vents.
  - Tube worms of genus *Riftia*.
  - Clams of the genus *Calymene*.
22. Chemosynthesis is significant as an energy-binding process because
- it provides an alternative to photosynthesis for organisms living in total darkness.
  - it provides a means of relief for some cancer patients.
  - it is the main energy-binding process for all plants living on earth.
  - it is the principal way crystal meth is synthesized.
23. Mutualism as a form of symbiosis implies
- that a large number of organisms forms a cooperative relationship.
  - that both organisms live together without either one gaining or losing from the relationship.
  - that both organisms mutually gain from the relationship.
  - that one organism gains from the relationship while the other neither gains nor loses.
  - That one organism gains from the relationship while the other loses from it.
24. The *zooxanthellae* that live in coral benefit by
- consuming the food particles the coral does not want.
  - consuming the flesh of the coral.
  - consuming carbon dioxide produced by the coral.
  - consuming carbohydrates and oxygen produced by the coral.
  - consuming parasites that infest the coral.
25. Commensalism as a form of symbiosis implies
- that a large number of organisms forms a cooperative relationship.
  - that both organisms live together without either one gaining or losing from the relationship.
  - that both organisms mutually gain from the relationship.
  - that one organism gains from the relationship while the other neither gains nor loses.
  - That one organism gains from the relationship while the other loses from it.
26. A cleaner shrimp benefits by
- consuming food particles not wanted by the fish being cleaned.
  - consuming the flesh of the fish it is cleaning.
  - consuming carbon dioxide produced by the fish it is cleaning.
  - consuming carbohydrates and oxygen produced by the fish it is cleaning.
  - consuming parasites that infest the fish it is cleaning.
27. A pilot fish benefits the shark it is associated with
- by showing the shark where to find food.
  - by providing hydrodynamic lift on the shark's fins.
  - by helping the shark attack live prey.
  - by tasting the food before the shark does, to verify that it is safe to eat.
  - not at all. A pilot fish neither helps nor hurts the shark it is associated with.

28. Which of the following is true about parasites?
- Parasites provide a very real benefit to their hosts, but their hosts simply don't appreciate it.
  - Nematode worms are the only parasites found in the marine environment.
  - Parasites don't usually kill their hosts, since that would be counterproductive.
  - Parasites are often rude to American tourists, unless they speak French without an accent.
29. Sketch a typical population growth curve and explain each part of it.
30. Explain the vertical migration of the deep scattering layer to shallow water every night. (this is not very complete in the textbook)
31. Explain *stable limit cycles* in the context of predator/prey relationships. What keeps a predator from wiping out its prey entirely? (this is not in the textbook)
32. Explain why biodiversity is generally considered a good thing. (this is not in the book)
33. List the various forms that interspecific relationships can take (e.g. competition, etc.) and whether they are +/+, +/-, and so forth.
34. Explain the concepts of disturbance, succession, and climax in the context of ecology. Should (and can) the British Petroleum Corporation (BP) return the US gulf coast exactly to the state it was before the horrific oil spill of 2010.
35. Discuss the advantages and drawbacks of life in the intertidal zone.
36. What advantages can you think of for being a stenohaline or stenothermal organism? (This is not in the textbook or lecture notes, but I'd like you to think about it)