

Ecology

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- Which of the following would not be an abiotic limiting factor?
 - too much water
 - too little potassium
 - too high temperature
 - insufficient nutrients
 - population overcrowding
- Much of the earth's sulfur is stored in
 - plants and animals
 - the oceans
 - the atmosphere
 - underground rocks and minerals
 - soil
- The hydrologic cycle is driven primarily by
 - solar energy
 - lunar tides
 - solar tides
 - mechanical energy
 - chemical energy
- "The maximum population of a given species that a particular habitat can sustain indefinitely without being degraded" is the definition of
 - logistic growth
 - environmental resistance
 - exponential growth
 - carrying capacity
 - biotic potential
- Ecosystems and global systems have limits to the stresses they can take. The level beyond which any additional stress will cause an abrupt and unpredictable change is called
 - stability
 - inertia
 - constancy
 - tipping point
 - resilience
- Which of the following would *not* be true of a tropical rain forest?
 - low net primary productivity
 - little ground level vegetation
 - low levels of ground level sunlight
 - high biodiversity
 - high humidity

7. An ecological niche includes all of the following *except*
 - a. the place where the species lives
 - b. how much water the species needs
 - c. how much sunlight the species needs
 - d. how much space the species needs
 - e. temperatures the species can tolerate
8. Nitrogen is a major component of all of the following *except*
 - a. proteins
 - b. nucleic acids
 - c. groundwater
 - d. ammonia
 - e. DNA
9. The biotic potential of a population is
 - a. the maximum reproductive rate of a population
 - b. the current rate of growth of a population
 - c. an expression of how many offspring survive to reproduce
 - d. determined by subtracting immigration minus emigration
 - e. the future growth rate of a population
10. Which of the following is *not* an adaptation of desert plants for their environment?
 - a. toxins in their stems to discourage being eaten
 - b. spines to discourage animals from taking their water
 - c. opening their pores only at night to prevent evaporation
 - d. store water in expandable tissues
 - e. reduced or no leaves
11. Which of the following is a primary link between photosynthesis and aerobic respiration?
 - a. phosphorus
 - b. sulfur
 - c. hydrogen
 - d. carbon
 - e. nitrogen
12. A species with a broad niche is considered a(n)
 - a. endemic species
 - b. endangered species
 - c. specialist species
 - d. native species
 - e. generalist species
13. A species in an ecosystem that shapes communities by creating and enhancing habitats in ways that benefit other species is called
 - a. foundation species
 - b. indicator species
 - c. native species
 - d. keystone species
 - e. specialist species

14. Aerobic respiration requires
- glucose and carbon dioxide
 - glucose and oxygen
 - oxygen and water
 - carbon dioxide and water
 - carbon dioxide and oxygen
15. Anaerobic respiration may produce all of the following *except*
- methane gas
 - hydrogen sulfide
 - carbon dioxide and water
 - ethyl alcohol
 - lactic acid
16. The concept that two or more species cannot share the exact same ecological niche for an extended period is called
- law of conservation of mass
 - principle of sustainability
 - interspecific competition
 - competitive exclusion principle
 - commensalism
17. The form of nitrogen most usable to plants is
- ammonia
 - nitrogen gas
 - proteins
 - nitrites
 - nitrates
18. This is the place where a population or an individual organism normally lives.
- community
 - habitat
 - territory
 - niche
 - zone
19. Each trophic level in a food chain or food web contains a certain amount of organic matter, called
- food
 - energy
 - biomass
 - organisms
 - decomposition
20. Which of the following would cause a population to overshoot its carrying capacity?
- an increase in predators
 - a decrease in birth rates
 - an increase in emigration
 - a decrease in environmental pressures
 - a reproductive time lag between birth and death rates

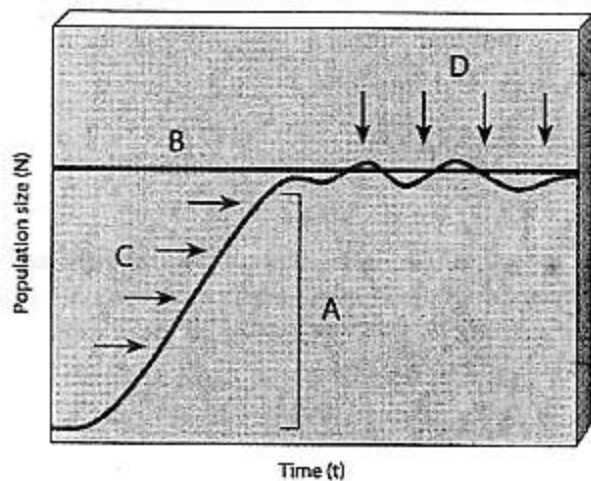
21. Plants such as bromeliads share a commensalism interaction with large trees in tropical and subtropical forests. The bromeliads are an example of
- parasites
 - opportunistic parasites
 - epiphytes
 - prey
 - herbivores
22. A species in an ecosystem that plays a central role in the health of that ecosystem, and whose removal may cause the collapse of the ecosystem, is called a(n)
- foundation species
 - indicator species
 - native species
 - keystone species
 - specialist species
23. Which of the following is *not* true of an r-selected species?
- They have a high rate of population increase.
 - Offspring are large in individual size.
 - They are opportunists.
 - They provide little or no parental care.
 - Offspring are large in number.
24. The intrinsic rate of increase (r) is
- the rate at which a population will reach its carrying capacity
 - the rate at which a population would grow with unlimited resources
 - determined by subtracting deaths from births and emigration from immigration
 - not influenced by environmental resistance
 - highest in large animals such as elephants and humans
25. Which of the following is said to occur when members of two or more species interact to gain access to the same limited resources?
- interspecific competition
 - predation
 - parasitism
 - mutualism
 - commensalism
26. In a range of tolerance, each population has a point beyond which no member of the population can live. This area beyond the ability to tolerate the conditions is called the
- zone of physiological stress
 - aquatic zone
 - zone of intolerance
 - zone of tolerance
 - optimum range

27. "Treeless, bitterly cold most of the year, winters are long and dark, low-growing plants, permafrost" are the characteristics of which of the following?
- tall-grass prairie
 - tundra
 - short-grass prairie
 - temperate grassland
 - savanna
28. Large ecological regions with characteristic types of natural vegetation and distinctive animals are called
- communities
 - ecosystems
 - biomes
 - ecospheres
 - populations
29. Organisms that feed only on plants are called
- detritivores
 - omnivores
 - carnivores
 - herbivores
 - decomposers
30. Which of the following is *not* an example of an indicator species?
- trout in water with a specific temperature requirement
 - birds that need a large forested area
 - butterflies that use a specific plant as food
 - frogs that take in water and air through their skin
 - All are examples of indicator species.
31. Which of the following is said to occur when one organism feeds on the body of, or the energy used by, another organism?
- interspecific competition
 - predation
 - parasitism
 - mutualism
 - commensalism
32. Which of the following is not a type of consumer?
- decomposer
 - chemosynthetic
 - omnivore
 - carnivore
 - detritivore
33. The *most* important factor in determining which biome is found in a particular area is
- soil type
 - topography
 - magnetic fields
 - climate
 - tidal activity

34. Which of the following would exhibit primary succession?
- a rock exposed by a retreating glacier
 - an abandoned farm
 - a clear-cut forest
 - newly flooded land
 - a recently burned forest
35. These are the smallest and most fundamental structural and functional units of life.
- atoms
 - molecules
 - compounds
 - cells
 - mitochondrion
36. On a field trip for a university class you observe an area filled with herbs, grasses, and low shrubs. These are examples of which of the following?
- pioneer species
 - early successional plant species
 - midsuccessional plant species
 - late successional plant species
 - climax plant species
37. The typical percentage of loss of energy in transfers from one trophic level to the next is about
- 1%
 - 5%
 - 35%
 - 60%
 - 90%
38. An ecosystem can survive without
- producers
 - consumers
 - decomposers
 - autotrophs
 - detritivores
39. Which of the following are *not* considered predators?
- omnivores
 - herbivores
 - detritivores
 - carnivores
 - All of these are predators.
40. Complex feeding patterns for consumers in an ecosystem are called
- food webs
 - food chains
 - trophic levels
 - pyramids of energy
 - trophic chains

41. Carbon is a major component of
- water
 - the oceans
 - organic compounds
 - the atmosphere
 - hydrologic cycle
42. Which of the following is *not* a part of the phosphorus cycle?
- soil
 - atmosphere
 - organisms
 - rocks
 - marine sediments
43. Which of the following is said to occur when an interaction benefits one species but has little, if any, effect on the other?
- interspecific competition
 - predation
 - parasitism
 - mutualism
 - commensalism
44. These are the parts of the earth's air, water, and soil where organisms are found.
- organism
 - population
 - community
 - ecosystem
 - biosphere
45. If you are walking through a forest dense with oak and hickory trees and thick with leaf litter underfoot, you would assume you are in a
- tropical savanna
 - temperate deciduous forest
 - tropical rain forest
 - temperate rain forest
 - coniferous forest
46. If grass stores 1,000 energy units received from the sun, the ecological efficiency of the ecosystem is 10%, and the trophic levels are grass → cow → human, how many units of energy does the human receive of the original 1,000 units?
- 900
 - 200
 - 100
 - 10
 - 1

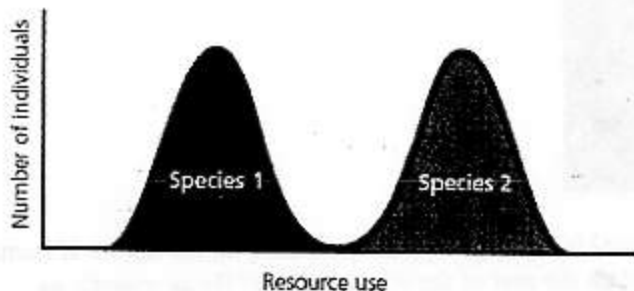
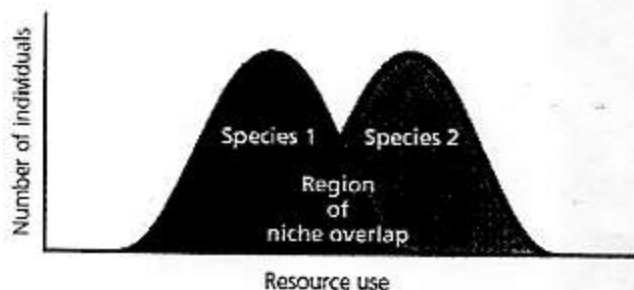
47. Organisms that complete the final breakdown and recycling of organic materials from the remains of all organisms are the
- detritivores
 - omnivores
 - carnivores
 - herbivores
 - decomposers
48. Which of the following is an r-strategist?
- human
 - cockroach
 - rhinoceros
 - saguaro cactus
 - whale
49. This is the total of all the different species that live in a certain area.
- organism
 - population
 - community
 - ecosystem
 - biosphere
50. Ecology is the study of
- human impact on the environment
 - the abiotic elements of the environment
 - the biotic elements of the environment
 - how organisms interact with each other and the abiotic environment
 - how evolution formed populations



Use the Figure above to answer the questions 51- 54.

51. Choose the letter that represents population size at which a population in a particular environment will stabilize when its supply of resources remains constant.

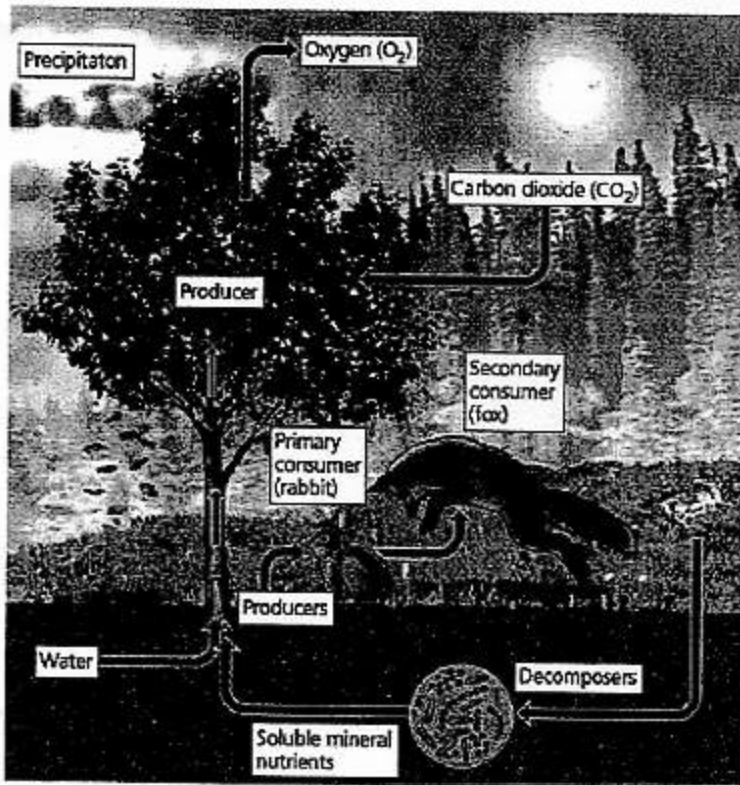
52. Choose the letter that represents when resources are not limiting and a population can grow at its intrinsic rate of increase.
53. Choose the letter that represents limiting abiotic factors.
54. Choose the letter that represents a population's capacity for growth.



55. Observe the Figure above. Notice that in the upper graph the two species overlap. That region of niche overlap places the species in competition for the shared resource. Explain why this is not useful and how the niches of the two species have come to be separated as shown in the lower graph.
56. At the present time the global human population approaches 7 billion persons. If we exceed the carrying capacity of the earth, the human population may suffer a substantial collapse. Given the following formula for population change:

$$\text{Population change} = (\text{births} + \text{immigration}) - (\text{deaths} + \text{emigration})$$

How would you suggest we reduce the growth rate of the entire human population rather than the population of a country, or area?



57. In the figure above, notice that the fox (secondary consumer) is in the process of pouncing on the rabbit. If humans were to remove that predator (fox), what would the effects on the rest of the ecosystem be? Be as specific as possible.
58. Thinking about the concept of trophic levels, explain why it may be necessary for humans to eat less meat. How much energy is lost from one level to the next? Use numbers to support your argument