CHIRAS

1. A system composed of living things and the interrelated physical and chemical environment is called a (an):
A) lithosphere
B) biosphere
C) ecosystem
D) ecotone
E) cline

2. A community of organisms and all of the interactions between them and their physical environment is a/an:
A) biome
B) habitat
C) ecosystem
D) biosphere
E) ecotone

3. Organisms of the same species within a biome or aquatic life zone are called a:
A) community
B) population
C) niche
D) food web
E) biome

4. A complex network of feeding interactions in a biological community is a:
A) food chain
B) food web
C) niche
D) trophic level
E) food pyramid

5. This group of organisms feeds on the plants produced on earth:
A) predators
B) herbivores
C) autotrophs
D) producers
E) carnivores

6. A series of organisms, each one feeding on the preceding organism forms a:
A) niche
B) habitat
C) biome
D) food chain
E) nutrient cycle

7. The position of an organism in a food chain is called a:
A) niche
B) food web
C) trophic level
D) ecotone
E) optimum range

8. The nonliving components of an ecosystem are called:
A) life zones
B) biotic
C) abiotic
D) taiga
E) decomposition

9. Two species cannot occupy the same niche for long periods. This principle is called:
A) range of tolerance
B) limiting factor
C) zone of intolerance
D) life zone
E) competitive exclusion

10. Plants belong to the:
A) first trophic level
B) second trophic level
C) third trophic level
D) fourth trophic level
E) fifth trophic level

11. Herbivores belong to the:
A) first trophic level
B) second trophic level
C) third trophic level
D) fourth trophic level
E) fifth trophic level

12. The dry weight of living material in the ecosystem is called:
A) detritus
B) biomass
C) biota
D) biosphere
E) biome

13. Terrestrial areas with a distinct climate and assemblage of plants and animals is called a:
A) biome
B) ecosystem
C) biosphere
D) ecotone
E) life zone

14. The northernmost biome is characterized by permafrost and is treeless. It is called the:
A) temperate deciduous forest
B) desert
C) taiga
D) tundra
E) grassland

15. The dominant plant type of the taiga are:
A) grasses
B) deciduous trees
C) conifers
D) scrubs
E) epiphytes

16. This biome has under 25 centimeters (10inches) of precipitation each year and abounds with plants and animals adapted to heat.
A) desert
B) temperate deciduous forest
C) grassland
D) tropical rainforest
E) taiga

17. This biome receives 200-400 centimeters (60-160 inches) of precipitation each year and has the highest species diversity of any biome.
A) desert
B) deciduous forest
C) taiga
D) tropical rain forest
E) tundra

18. These saltwater habitats are located at the mouths of rivers where fresh and saltwater mix and are often associated with coastal wetlands:
A) coral reefs
B) estuaries
C) tidal pools
D) continental shelf
E) abyssal plain

19. Salt marshes, mangrove swamps and mud flats are all:
A) coral reefs
B) tidal pools
C) estuaries
D) coastal wetlands
E) shorelines

20. This aquatic life zone is found in saltwater and consists of calcium carbonate or limestone deposits. This life zone is the aquatic equivalent of the tropical rain forest:
A) shorelines
B) estuaries
C) coral reefs
D) salt marshes
E) coastal wetlands

21. The region of the sea floor that extends from the land masses and slopes gradually is called the:
A) abyssal plain
B) shoreline
C) continental shelf
D) continental slope
E) euphotic zone

22. This zone of the marine ecosystem is the oceanic equivalent of the limnetic zone of lakes:
A) neritic zone
B) euphotic zone
C) abyssal zone
D) bathyal zone
E) littoral zone

23. Biological communities that form on barren or lifeless ground are an example of:
A) natural selection
B) primary succession
C) secondary succession
D) restoration biology
E) zootic climax

24. The colonization of a new volcanic island by organisms is a good example of:
A) primary succession
B) secondary succession
C) restoration biology
D) climax community
E) zootic climax

25. _____ are relatively stable ecosystems believed to be the end point of natural succession.
A) Pioneer communities
B) Intermediate communities
C) Climax communities
D) Immature ecosystems
E) Human ecosystems

26. The biological community formed after the eruption of Mt. Saint Helens is a good example of:
A) climax communities
B) primary succession
C) secondary succession
D) zootic climax
E) speciation

27. Lichens growing on rocks are a classic example of:
A) speciation
B) natural selection
C) competition
D) primary succession
E) secondary succession

28. Formation of new species in different geographical areas that are reproductively isolated is called _____ speciation.
A) allopatric
B) sympatric
C) reproductive
D) geographic
E) adaptive

29. Which of the following are abiotic factors?
A) competition
B) predation
C) parasitism
D) weather
E) population size

30. The loss of species diversity is called:
A) reclamation
B) turn over
C) environmental resistance
D) ecosystem simplification
E) monoculture

31. Which of the following is not a biotic factor:
A) availability of water
B) competition
C) predation
D) parasitism
E) disease

32. In mature ecosystems, one would expect to find:
A) low diversity and high stability
B) low diversity and low stability
C) high diversity and high stability
D) high diversity and low stability
E) linear food chains and low stability

33. In mature ecosystems, one would expect to find low:
A) species diversity
B) stability
C) nutrient conservation
D) net productivity
E) all of the above

34. New varieties of plants produced by selective breeding of closely related plants are called:
A) mutants
B) genetically engineered plants
C) hybrids
D) ecotypes
E) inbred varieties

35. The Gopher tortoise share their burrows with many other organisms; it is a/an:
A) predator
B) important prey item
C) keystone species
D) producer
E) competitor with other species

36. About ___% of all prescription and nonprescription drugs are made with chemicals derived from wild plants

A) 10
B) 20
C) 30
D) 40
E) 50

37. This keystone predator in the marine ecosystem of the U.S. Pacific feeds on sea urchins, abalone, crabs, and mollusks that inhabit kelp beds:

A) sea otter
B) blue whale
C) barracuda
D) sea lion
E) walrus

38. The loss of water from the soil and leaves is:

A) evaporation
B) transpiration
C) evapotranspiration
D) sublimation
E) condensation

39. The degradation of organic pollutants by bacteria under aerobic conditions uses up _____ in the water.

A) carbon dioxide
B) oxygen
C) iron
D) methane
E) carbon

40. These substances are often the limiting factor for the growth of many plants:

A) sulfur and nickel
B) manganese and copper
C) nitrogen and phosphorus
D) carbon and hydrogen
E) water and chlorine

BOTKIN

41The region of the Earth where life exists is known as:

a) the biota
b) the crust
c) the biosphere
d) the biozone
e) Gaia

42 Uniformitarianism is:

a) the principle that everything affects everything else
b) a New England religion, the first to become active in environmentalism
c) the principle that the past can be understood by studying the processes operating at present
d) the belief that the Earth functions as a single living organism
e) the principle that differences within the environment are small relative to the overall similarities

43 The following chemical equation describes which process:

$6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$

a) photosynthesis
b) oxidation
c) pyrolysis
d) respiration
e) carbonation

44 The original source of energy that drives the hydrologic cycle is:

a) rain
b) thermal energy
c) solar energy
d) gravity
e) photosynthesis

45 A set of interacting species that live in the same area is called a(n):

a) ecological community
b) community level effect
c) keystone species
d) ecosystem
e) individual species

46 Which of the following is an example of three different species on three different trophic levels, listed from lowest level to highest:

a) shrubs, trees, giraffes

b) humans, cows, grass

c) sharks, herbivorous fish, carnivorous fish

d) moss, reindeer, wolves

e) dirt, corn, humans

47 Energy, chemical elements, and other compounds are transferred from creature to creature along:

a) symbiotic links

b) food chains

c) biogeochemical cycles

d) trophic levels

e) trophic paths

48 In hot springs live photosynthetic bacteria and algae. Some flies, called *Ephydrid* flies lie eggs onto the algae mats. Their larvae feed on the algae and the bacteria. Another fly, the *Colichopodid* fly feeds on the eggs and larvae of the herbivorous fly. Dragonflies, wasps, spiders, tiger beetles also feed on the *Ephydrid* fly. The *Ephydrid* flies also have a parasite, a red mite that feeds of the fly eggs and travels attached to the body of the fly. Another animal, a small wasp lays eggs within the fly larvae. All wastes and dead material are fed on by decomposers, which in hot springs are primarily bacteria. Dragonflies, wasps, spiders, tiger beetles that feed on the *Ephydrid* fly feed on the _____.

a) first trophic level

b) second trophic level

c) third trophic level

d) fourth trophic level

e) fifth trophic level

49 In hot springs live photosynthetic bacteria and algae. Some flies, called *Ephydrid* flies lie eggs onto the algae mats. Their larvae feed on the algae and the bacteria. Another fly, the *Colichopodid* fly feeds on the eggs and larvae of the herbivorous fly. Dragonflies, wasps, spiders, tiger beetles also feed on the *Ephydrid* fly. The *Ephydrid* flies also have a parasite, a red mite that feeds of the fly eggs and travels attached to the body of the fly. Another animal, a small wasp lays eggs within the fly larvae. All wastes and dead material are fed on by decomposers, which in hot springs are primarily bacteria.
The *Ephydrid* fly is an example of a

a) carnivore

b) herbivore

c) parasite

d) decompose

e) chemosynthesizer

50 In hot springs live photosynthetic bacteria and algae. Some flies, called *Ephydrid* flies lie eggs onto the algae mats. Their larvae feed on the algae and the bacteria. Another fly, the *Colichopodid* fly feeds on the eggs and larvae of the herbivorous fly. Dragonflies, wasps, spiders, tiger beetles also feed on the *Ephydrid* fly. The *Ephydrid* flies also have a parasite, a red mite that feeds of the fly eggs and travels attached to the body of the fly. Another animal, a small wasp lays eggs within the fly larvae. All wastes and dead material are fed on by decomposers, which in hot springs are primarily bacteria.
The small wasp that lays eggs within the *Ephydrid* fly larvae feed on the _____ and is a _____.

a) first trophic level, herbivore

b) second trophic level, carnivore

c) third trophic level, parasite

d) fourth trophic level, decompose

e) fifth trophic level, predator

51 An ecological community is:

a) a set of interacting species that occur in the same place

b) a system of interdependent living and nonliving components in a given area over a given period of time

c) a system based on the living environment

d) the smallest group that has all characteristics necessary to sustain life

e) the total physical and chemical environment of a continent

52 All of the following are able to produce food by direct interaction with sunlight **except:**

a) trees
b) kelp
c) green algae
d) fungi
e) corals

53 The development from early to middle stages of succession results in

a) an increase in species diversity
b) a decrease in species diversity
c) no change in species diversity

54 Occasional (at least once every 50 years), light fires in jack pine forests in Michigan result in

a) an increase in species diversity
b) a decrease in species diversity
c) no change in species diversity

55 Heterogeneity of the physical environment results in

a) an increase in species diversity
b) a decrease in species diversity
c) no change in species diversity

56 Moderate grazing in a pasture in comparison to no grazing results in

a) an increase in species diversity
b) a decrease in species diversity
c) no change in species diversity

57 Sea otters live along the Pacific coast of the U.S. and Canada. The otters feed upon sea urchins, and urchins feed upon kelp. Reduction in the number of sea otters leads to an explosion in sea urchin populations, declines in kelp, and declines in all other species that feed upon kelp. Given this information, sea otters are an example of a(n):

a) food chain
b) dominant species
c) omnivore
d) keystone species
e) an important animal

58 The total number of genetic characteristics of a specific biological population is called:

a) mutation
b) genetic diversity
c) competitive exclusion
d) ecological gradient
e) genetic drift

59 Principle that species with identical requirements cannot coexist in a habitat:

a) mutation
b) genetic diversity
c) competitive exclusion
d) ecological gradient
e) genetic drift

60 In which of the following situations is adaptive radiation most likely to occur:

a) where species evenness is high
b) where species diversity is high
c) in stable environments, with little change over time
d) in arid climates
e) where populations are isolated from the rest of the world

61 The Mississippi River delta of Louisiana is a very special environment. The combined effect of geological subsidence, opening of shipping lanes through the delta, channelization of the river and its distributaries is an example of:

a) biological evolution

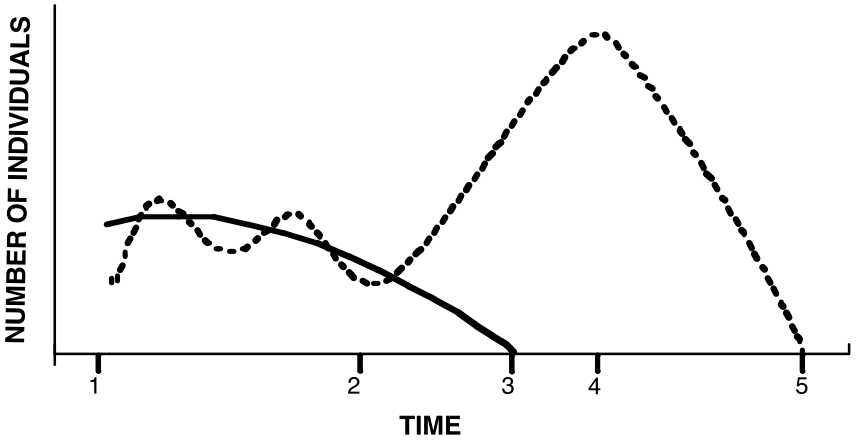
b) human interaction with the environment

c) introduction of exotic species

d) genetic engineering

e) geographic isolation

62 In the figure below, the growth of Species A between Times 2 and 4 suggests that:



The graph above shows the growth of populations of two different species of wombats in the same ecosystem. Species A is shown by the dashed line; Species B is the solid line. Both species use the same resources.

a) space was not limiting

b) predation limited the population

c) competition for limited resources limited the population

d) food was not a limiting factor

e) the question cannot be answered from the information provided

63 These organisms live at or near deep ocean vents and derive energy from inorganic sulfur compounds:

a) autotrophs

b) chemautotrophs

c) biotrophs

d) heterotrophs

e) homotrophs

64 These organisms make sugar from sunlight, carbon dioxide and water:

a) autotrophs
b) chemautotrophs
c) biotrophs
d) heterotrophs
e) homotrophs

65 These organisms cannot make their own organic compounds from inorganic ones and must feed on other living things:

a) autotrophs
b) chemautotrophs
c) biotrophs
d) heterotrophs
e) homotrophs

66 Biomass refers to the amount of organic matter. The Earth's biomass may be measured in units of _____. The change in biomass is called _____.

a) grams per m^2; net production
b) kg * m / sec^2; deforestation
c) m^3; productivity
d) hectares; organic flux
e) kg; productivity

67 How does chemosynthesis differ from photosynthesis:

a) the energy in hydrogen sulfide is used by certain bacteria to make organic compounds
b) chemosynthesis is more energy efficient than photosynthesis
c) chemosynthesis takes place only in the absence of sunlight
d) a and b are correct
e) all of these

68 Matter and energy are both always conserved, both in physical systems and biological systems. This principle is stated in the:

a) first law of enthalpy
b) first law of entropy
c) first law of thermodynamics
d) the first law of energy efficiency
e) the second law of thermodynamics

69 Net production equals:

a) change in biomass over time
b) gross production minus photosynthesis
c) sustainable yield
d) total production minus gross production
e) biomass plus respiration

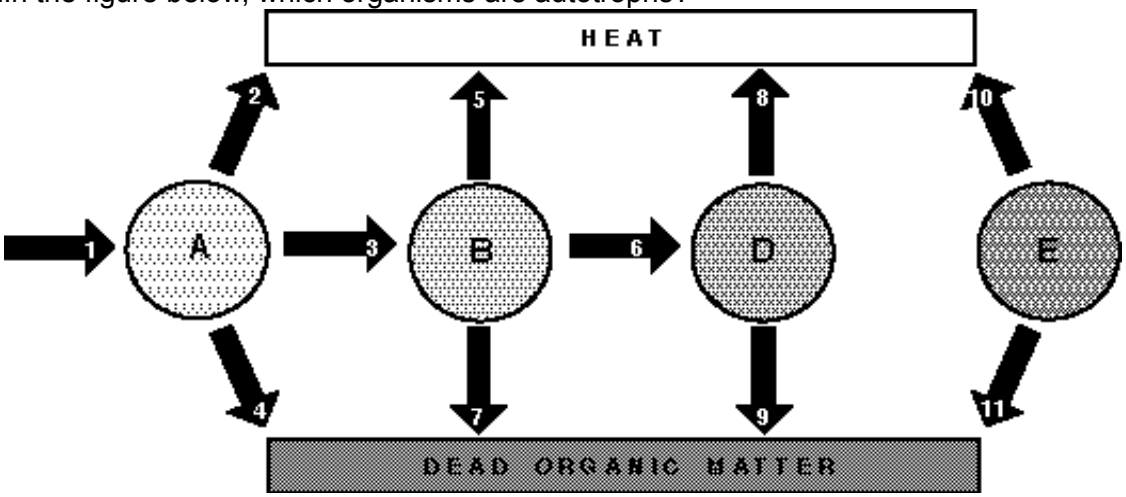
70 What are detrivores:

a) organisms that live in symbiosis with another organism
b) organisms that feed on dead organic material
c) organisms that feed on plants only
d) organisms that hunt for food
e) organisms that produce their own food

71 In the marine system, which of the following are autotrophs:

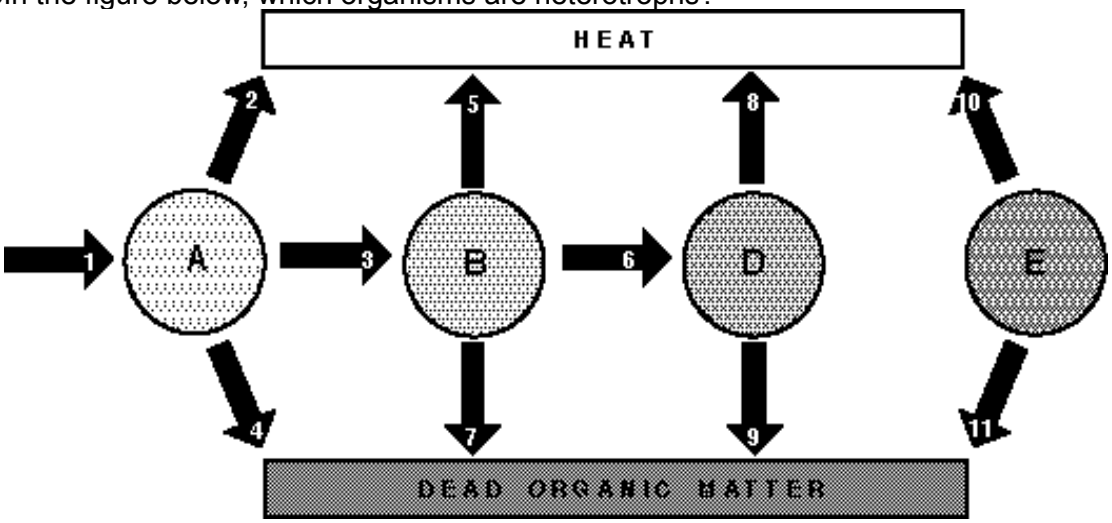
a) herbivorous fish
b) sharks
c) phytoplankton
d) zooplankton
e) filter-feeders

72In the figure below, which organisms are autotrophs?



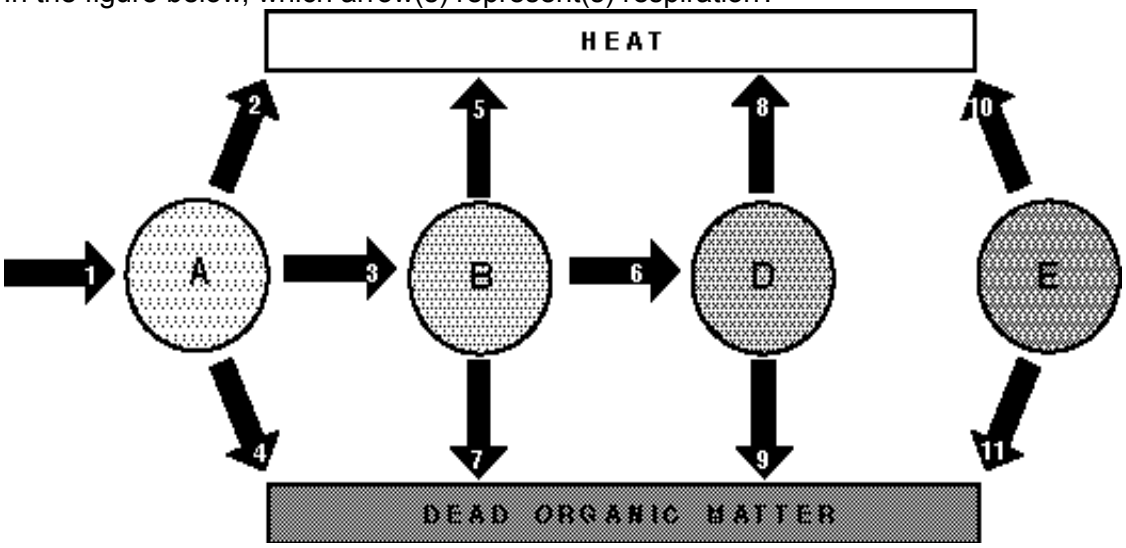
a) green plants
b) herbivores
c) carnivores
d) decomposers
e) none of these

73In the figure below, which organisms are heterotrophs?



a) green plants
b) herbivores
c) carnivores
d) decomposers
e) none of these

74 In the figure below, which arrow(s) represent(s) respiration?



a) 1
b) 2 and 3
c) 3
d) 4
e) 2 and 5

75 The principle that one species can prepare the way for the next and/or may even be necessary for the occurrence of the next is called:
a) tolerance
b) succession
c) facilitation
d) interference
e) reforestation

76 Gradual, sequential changes in the composition of an ecosystem, particularly following an initial disturbance is called:
a) tolerance
b) succession
c) facilitation
d) interference
e) reforestation

77 Succession usually occurs:

a) in harsh environments
b) where nutrients are limited
c) where disturbance is unusual or rare
d) where a physical, degrading environment dominates
e) after each disturbance, the environment fulfills all the above criteria

78 Succession in a bog is the process that:

a) begins with forest and ends with a sphagnum moss filled bog
b) begins with open water and ends with a forest
c) fills up a body of water with sediment
d) increases the chemical elements in a body of water
e) allows a pond to change from an oligotrophic to an eutrophic environment

79 As a pond goes from an early successional stage to late succession, it acquires all of the following characteristics except:

a) water in the pond becomes richer in nutrients
b) sediments at the bottom of the pond become more organic rich
c) water in the pond becomes less clear
d) greater biological productivity
e) the pond becomes “oligotrophic”

80 In a forest ecosystem, most short-lived plant species die out after about 30 years of ecological succession because these species:

a) cannot tolerate the higher levels of nutrients in the soil
b) require a high groundwater level
c) live no longer than 30 years
d) cannot grow in the shade of trees that develop later
e) become victims of herbivorous animals species that move in

81 The main reason that succession does not lead to a “climax state”, in which organic matter and stored chemical elements are both at a maximum is that:

a) organic matter and chemical elements become concentrated in the soil, not in biomass
b) after a time, decreased input of sunlight reduces biological production
c) human activities always interfere before the final balance is achieved
d) late-successional animal species deplete the ecosystem of organic matter and chemical elements
e) through time, erosion removes organic matter and chemical elements

82 Which of the following is an example of facilitation?

a) fire helps some seeds germinate
b) bamboo growth prevents neighboring plant species from germinating
c) pine trees provide shade that promotes the growth of oak trees
d) lichens breaking down bare rock
e) all of these

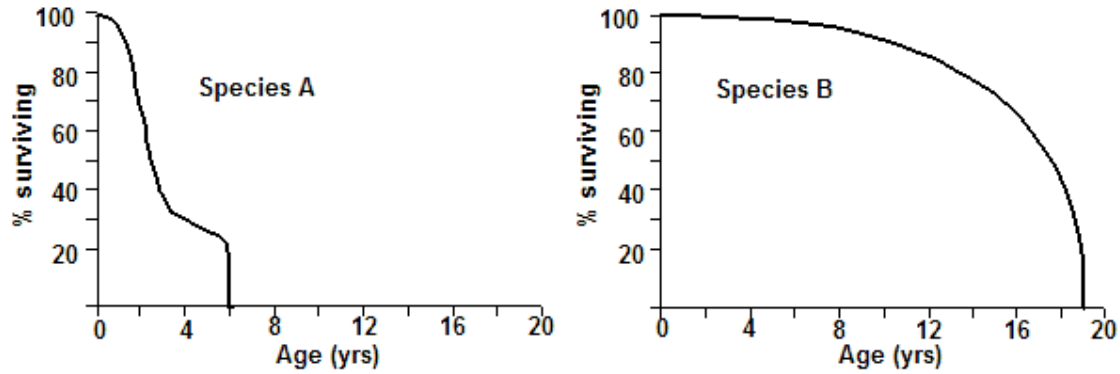
83 Monoculture production of crops is more vulnerable to outbreaks of disease because this type of farming:

a) requires increased irrigation
b) simplifies the ecosystem
c) increases the diversity of pests
d) causes soil erosion
e) enriches the local floras by introducing fertilizers

84 When a pest develops resistance to a chemical, all of the following are true except:

a) natural selection took place
b) it developed adaptations during times of secondary pest outbreaks
c) mutation and genetic drift took place
d) evolution selected for individuals better resistant to the chemical
e) higher quantities of pesticide will be required in the next application

85Based only on the graphs below, which species (A or B) would be more likely to survive periodic disturbances?



You are the manager of a reserve which contains two herbivorous species, A and B. The survivorship curves of the two species have been estimated in the graphs above.

a) A

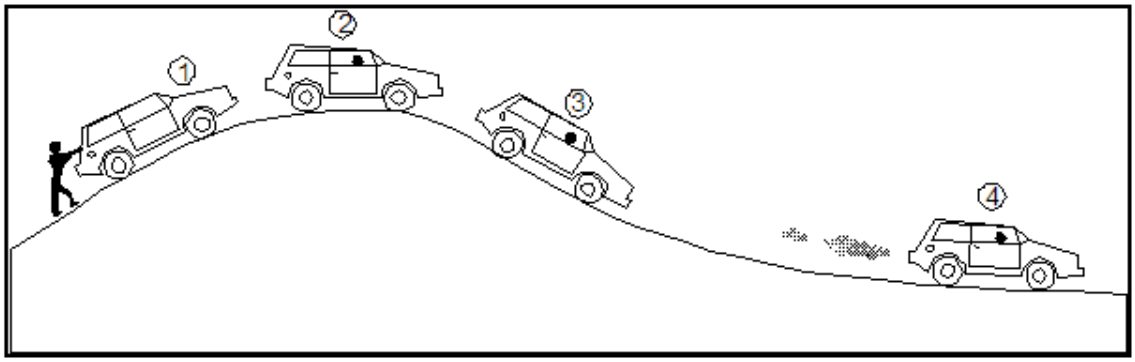
b) B

c) C

d) D

e) E

86At position 4 in the figure below, the car is accelerating. The energy that causes that acceleration is coming from:



a) potential energy

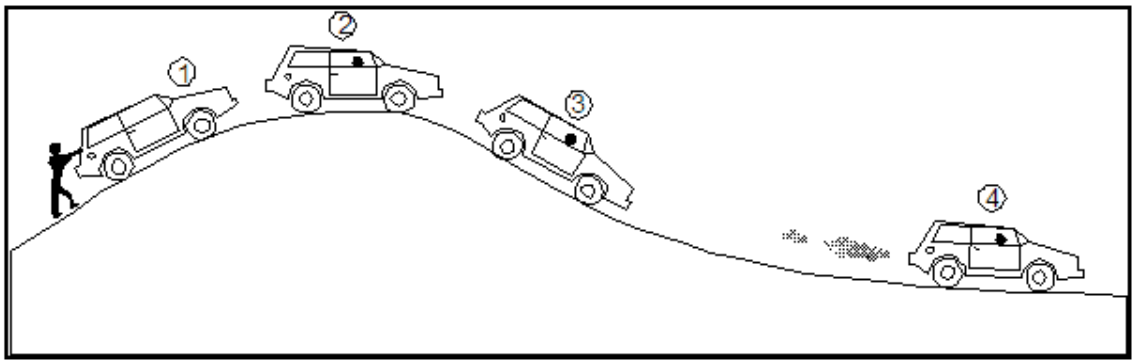
b) kinetic energy

c) chemical potential energy

d) momentum

e) heat

87At position 5 in the figure below, which is 100 meters down the road from position 4, there is a stop sign. When the car has stopped, all of the energy that went into moving the car goes into:



a) potential energy
b) kinetic energy
c) chemical potential energy
d) momentum
e) heat

88Energy:

a) is the product of force times distance
b) can be destroyed
c) is always conserved
d) cannot be transformed
e) cannot be conserved

CUNNINGHAM

89. Potential energy is _____ energy.
A. electrical
B. motion
C. stored
D. heat
E. latent

90. The motion of a rock rolling downhill is known as _____ energy.
A. kinetic
B. latent
C. potential
D. electrical
E. mechanical

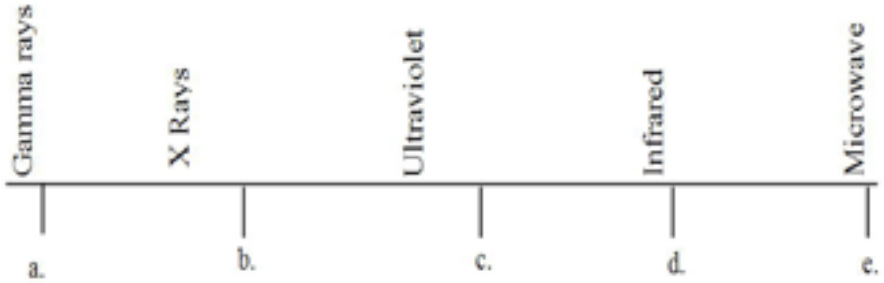
91. Metabolism can be seen as the process of converting
A. energy into matter.
B. potential energy into kinetic energy.
C. kinetic energy into potential energy.
D. atoms into compounds.
E. matter into potential energy.

92. The first law of thermodynamics and the law of conservation of matter are similar in that
A. under normal circumstances neither energy or matter is created nor destroyed.
B. both energy and matter are recycled through biological systems.
C. both energy and matter flow in a oneway path through biological systems.
D. under normal circumstances energy and matter are destroyed as they pass through biological systems.
E. The first law of thermodynamics and the law of conservation of matter are not similar.

93. The second law of thermodynamics states that as energy moves through different forms and systems it gradually
A. becomes more concentrated.
B. dissipates and becomes unavailable.
C. disappears and is lost.
D. accumulates in the form of electricity.
E. changes from kinetic to potential energy.

94. As energy is used and transformed it gradually becomes _____ quality and _____ concentrated.
A. higher, more
B. lower, more
C. higher, less
D. lower, less
E. As energy is used it does not become transformed; there is no change in quality and it stays the same concentration.

The Electromagnetic Spectrum



95. On the spectrum of solar energy wavelengths, visible light falls near the letter
A. a.
B. b.
C. c.
D. d.
E. e.

96. On the spectrum of solar energy wavelengths, the wavelengths that plants use for photosynthesis is closest to which letter?
A. a.
B. b.
C. c.
D. d.
E. e

97. About _____ percent of the solar energy that falls on plants is captured for photosynthesis.
A. 100
B. 60 – 70
C. 40 – 50
D. 10 – 20
E. 1 – 2

98. Photosynthesis produces sugars from
A. water, carbon dioxide, and energy.
B. water, other sugars, and oxygen.
C. oxygen, carbon dioxide, and water.
D. carbon dioxide, enzymes, and energy.
E. oxygen, water, and energy.

99. The process of photosynthesis and cellular respiration are similar in that they both
A. capture energy in the form of sugar.
B. occur in all living organisms.
C. store energy in ATP, an energy currency for the cell.
D. capture energy from the sun.
E. Photosynthesis and cellular respiration are not similar, they are opposite processes.

100. Although there are exceptions, in general, a species includes all organisms that are similar enough to
A. produce fertile offspring in nature.
B. look alike.
C. fill the same niche.
D. occupy the same community.
E. live together.

101. All members of a species that live in the same area at the same time make up a(an)
A. species.
B. ecosystem.
C. community.
D. population.
E. biome.

102. A biological community consists of all
A. populations living and interacting in an area.
B. members of a species living in the same area.
C. living things on Earth.
D. populations of a given species.
E. members of a species living in the same biome.

103. An ecosystem consists of
A. a physical environment within which a biological community lives.
B. the species with which a biological community interacts.
C. a biological community and its physical environment.
D. the primary producers within a biological community.
E. all organisms of the same kind that are genetically similar enough to breed in nature and produce fertile offspring.

104. With respect to _____, every ecosystem is open.
A. species
B. populations
C. matter cycling
D. energy flow
E. inorganic compounds

105. Productivity in an ecosystem has to do with
A. the efficiency of its primary producers.
B. the number of different species living in the ecosystem.
C. its longevity.
D. the combined metabolic rate of the biological communities.
E. its rate of producing biomass.

106. How can a highly productive ecosystem (high total productivity) have a low net productivity?
A. The rate of decomposition is high.
B. The rate of secondary productivity is high.
C. The rate of photosynthesis is low.
D. The rate of decomposition is low.
E. The rate of secondary productivity is low.

107. Biomass includes all
A. material in an ecosystem.
B. things that are living at a given time.
C. living and nonliving things.
D. matter produced by primary producers.
E. biological material.

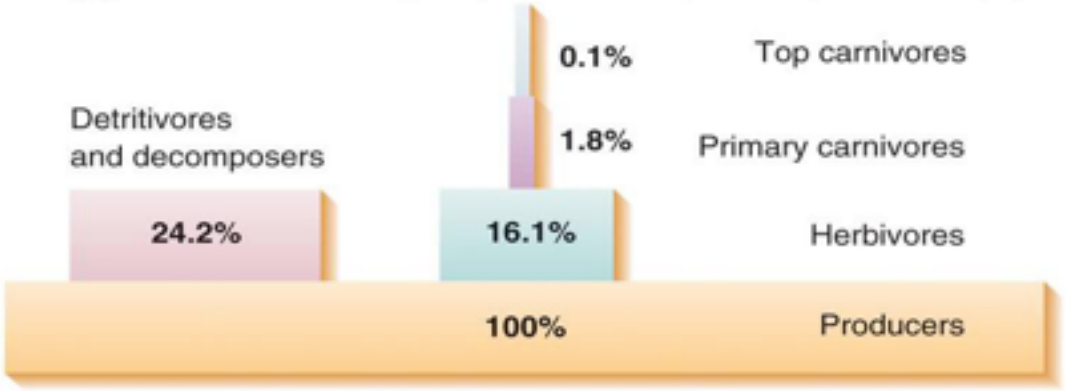
108. A simple linked feeding series such as grass ->rabbit ->wolf is known as a(n)
A. energy cycle.
B. food web.
C. carbon cycle.
D. food chain.
E. food cycle.

109. Producers rely on _____ to release chemical energy and consumers rely on _____ to release chemical energy.
A. cellular respiration, photosynthesis
B. cellular respiration, cellular respiration
C. photosynthesis, cellular respiration
D. photosynthesis, photosynthesis
E. the sun, the sun

110. In the biomass pyramid above, the bottom level (shown by letter d) represents
A. primary producers.
B. primary consumers.
C. herbivores.
D. carnivores.
E. detritivores.

111. Detritivores, scavengers, and decomposers are all similar in that they
A. consume nonliving organic matter.
B. are primarily microorganisms.
C. are primary producers.
D. are among the Earth's least useful organisms.
E. consume abiotic material.

112. Which of the following does not cycle repeatedly through the Earth's ecosystems?
A. water
B. nitrogen
C. matter
D. carbon
E. energy



113. Refer to figure 3.16, if the ecosystem is in equilibrium and there are two top carnivores, then most likely there are/is
A. at least 2 primary carnivores for every top carnivore in the system
B. at least 161 times as many herbivores as there are top carnivores
C. at most twice as many herbivores
D. at most 18 times as much biomass in the primary carnivore trophic level as in the top carnivore trophic level
E. at least 2000 times as much biomass in the producer trophic level as in the top carnivore trophic level

114. Populations are most critically limited by all of the following reasons EXCEPT
A. available food.
B. suitable shelter from the elements.
C. available water.
D. suitable shelter from predators.
E. micronutrients.

115. Natural selection will ultimately makes a species
A. more intelligent.
B. physically bigger.
C. more adapted to its environment.
D. more aggressive.
E. less vulnerable to its predators.

116. Your friend stated that natural selection would occur at the individual level while evolution and adaptation would occur at the population level. How would you respond to your friend?
A. I would agree because individuals cannot change their genetic makeup.
B. I would agree because individuals can adapt to their environment.
C. I would disagree because populations cannot change their genetic makeup.
D. I would disagree because populations can adapt to their environment.
E. I would disagree because individuals can adapt to their environment.

117. Certain nightactive moths and dayactive birds are specialized nectar feeders. How do these
species coexist if they are using the same resource for food?
A. Since they both use the nectar eventually one of the two species will need to move to a new area.
B. They do not compete for the nectar because they feed at different times of the day.
C. There is enough nectar to supply both the birds and the moths with their feeding needs.
D. Eventually the niche breadth will increase and there will be less competition.
E. Eventually they will overconsume the nectar resources and neither will survive.

118. A keystone species is a species whose presence
A. is the main reason a community exists.
B. provides food for all other species in a community.
C. is an indicator of environmental health.
D. influences the population size of many other species in its community.
E. is always at the top of the trophic levels as a top predator.

119. Intraspecific competition is competition among _____ for resources.
A. predators and prey
B. both plants and animals
C. producers, consumers, and detritivores
D. members of different species
E. members of a single species

120. An especially effective strategy for reducing intraspecific competition is
A. different ecological niches for juveniles and adults.
B. rapid reproduction.
C. eating prey before they are "ready" (ripe) for other species.
D. resource partitioning.
E. plants dropping their seeds right below the parent plant.

121. Territoriality is an important form of _____ for many animal species.
A. symbiotic behavior
B. interspecific competition
C. intraspecific competition
D. commensalism
E. resource partitioning

122. Symbiosis means
A. a relationship in which both species benefit.
B. a parasitic relationship.
C. commensalism.
D. living together.
E. a relationship in which one species benefits and the other does not benefit.

123. In the partnership of a lichen, the fungus provides _____ and the relationship is best described as_____.
A. most of the photosynthesis; symbiosis
B. poisons that deter predation; commensalism
C. structure and moisture holding ability; mutualism
D. very little to the algal partner; parasitism
E. some of the photosynthesis; commensalism

124. When looking at the relative biomass accumulation of major world ecosystems, ecosystem "d" is probably
A. desert.
B. tropical rainforest.
C. intensive agriculture.
D. estuaries.
E. either "tropical rainforest" or "estuaries."

125. Primary succession occurs when a community develops _____ while secondary succession occurs when one _____.
A. into a climax community, species replaces another
B. and replaces another, ecosystem becomes stable
C. on unoccupied ground, biological community replaces another
D. and then fails, niche changes
E. intraspecific competition, experiences interspecific competition

126. Which of the following are pioneer species?
A. wood warblers
B. dandelions
C. starlings
D. lichens
E. humans

(a) Random © Corbis Royalty Free
(b) Uniform © Eric and David Hosking/Corbis
(c) Clustered © Fred Bavendam/Peter Arnold

127. Refer to the figure above, which distribution pattern/s would most likely evolve in the presence of predators given an environment with minimal geographic variation?
A. Random
B. Uniform
C. Clustered
D. Random and uniform
E. Clustered and uniform

128. A plant species not experiencing predation but competing for available sunlight in a tropical rainforest would most likely exhibit which distribution pattern.
A. Random
B. Uniform
C. Clustered
D. Random and clustered
E. Clustered and uniform

129. All of the following are examples of a specialization that plants in the desert may have EXCEPT
A. storing water in stems or roots
B. reducing water loss with thick epidermal layers
C. shedding leaves in the driest seasons
D. using spines for shade
E. large leaves facing the sun.

130. Having needleshaped leaves benefits plants because needles
A. reduce water loss and endure cold winters.
B. are more efficient at photosynthesis because they are dark green.
C. evaporate water more efficiently.
D. do not rot in the excessive rainfall that characterizes coniferous forests.
E. are less resistant to strong winds.

131. Which of the following practices contributes the least to antibiotic or pesticide resistance?
A. Domestic farm animals are fed low doses of antibiotics to increase weight gain.
B. A person takes the full course of the appropriate antibiotic when she has a virus infection.
C. A person takes the full course of the appropriate antibiotic when she has a bacterial infection.
D. A person takes an antimalarial drug when he does not have malaria.
E. Mosquito populations in the tropics have been sprayed with DDT for about 50 years.

132. Pesticide resurgence is part of the problem of pesticide resistance and happens when a pest organism
A. that was dormant during pesticide application becomes active and produces offspring.
B. adapts to the pesticide and produces tolerant offspring.
C. adapts to the pesticide and produces even more pesticidetolerant offspring.
D. that is tolerant to the pesticide survives and produces tolerant offspring.
E. receives a gene for pesticide tolerance through a virus infection.

133. Pesticide resistance occurs when a population of pests
A. becomes too numerous for chemicals to control.
B. genetically changes (through natural selection) and is no longer affected by the chemicals.
C. grows extremely large because of chemical misapplications.
D. is not affected by chemicals because the pesticide chemicals do not break down in the environment.
E. is completely wiped out by the pesticide chemicals.

134. We are usually referring to species diversity when we talk about biodiversity. However, genetic diversity is also important to ecological systems because diverse genes
A. increase the efficiency and productivity of a system because all niches are filled.
B. allow an individual organism to adapt to its changing environment.
C. are necessary for a population to evolve in a changing environment.
D. lead to diverse ecological processes in a biological community.
E. are important for a balanced ecosystem.

135. Ecological diversity is a measure of the number of
A. different kinds of organisms within a community or ecosystem.
B. different versions of the same gene in an ecological community.
C. sizes, colors, and shapes of organisms within an ecological community.
D. niches, trophic levels, and ecological processes of a biological community.
E. different species in an ecosystem.

Use the following scenario:

Your friend is upset because his conception of what a species is has been challenged. His professor told him that there are some problems associated with the common way that a species is identified. Your friend learned what a species was while in high school and it was reinforced during his first year in college. He also refers to the third chapter in your environmental science book for this definition. Your friend wonders if this professor knows what she is talking about. You explain to him that there really are some problems associated with the common way that a species is defined and you think that this professor is correct.

136. The common way that a species is defined in biology (the way it is defined in Chapter 3) is in
genetic diversity is also important to ecological systems because diverse genes
A. produce fertile offspring in nature.
B. look alike.
C. fill the same niche.
D. occupy the same community.
E. live together.

137. You also mentioned to your friend that a new tool, DNA sequencing technology, is radically changing the way species are identified. In fact, some groups that were originally thought to be far apart now seem to be closely related. Which of the following statements does not reflect the implications of using this new tool?
A. This tool will end the debate of what is or is not a species.
B. This tool allows us to see how closely related species are in terms of their genetics.
C. This tool helps us better understand molecular evolution.
D. This tool helps us better understand how species actually originate.
E. This tool helps us judge genetic diversity.

Use the following scenario:

There are three ecological communities, each with differing species, but all of them have 100 individual plants and animals.
Community A has 21 species. Of the 110 individuals, there are 50 individuals of one species and 3 each of the other 20 species.
Community B has 11 species. Of the 110 individuals, there are 90 individuals of one species and 2 each of the other 10 species.
Community C has 11 species. Of the 110 individuals, there are 10 individuals of each species.

138. In the scenario above, which community has the highest species richness?
A. Community A
B. Community B
C. Community C
D. Community A and C are the same.
E. Community A and B are the same.

139. In the scenario above, which communities have the same species evenness?
A. Community A and C
B. Community B and A
C. Community C and B
D. All three communities have the same species evenness.
E. None of the communities have the same species evenness.

140. In the scenario above, which communities have the same species richness?
A. Community A and C
B. Community B and A
C. Community C and B
D. All three communities have the same species richness.
E. None of the communities have the same species richness.

141. A disadvantage of monoculture agroforestry is that it is
A. difficult to harvest with clearcut methods.
B. susceptible to pests and requires pesticides.
C. difficult to replant.
D. economically inefficient.
E. takes more time to replant.

142. Plants store solar energy by
A. changing phase.
B. creating kinetic energy.
C. creating the chemical bonds of sugar molecules.
D. transforming it into electrical energy.
E. Plants do not store solar energy.