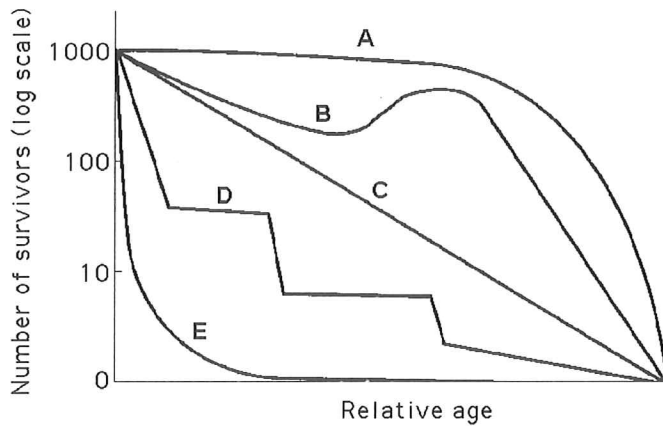


MYP Ecology Part II Formative**Multiple Choice**

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

- _____ 1. A population is *correctly* defined as having which of the following characteristics?
- I. inhabiting the same general area
 - II. individuals belonging to the same species
 - III. possessing a constant and uniform density and dispersion
- a. I only
 - b. III only
 - c. I and II only
 - d. II and III only
 - e. I, II, and III
- _____ 2. A biologist reported that a sample of ocean water had 5 million diatoms of the species *Coscinodiscus centralis* per cubic meter. What was the biologist measuring?
- a. density
 - b. dispersion
 - c. carrying capacity
 - d. quadrats
 - e. range
- _____ 3. A table listing such items as age, observed number of organisms alive each year, and life expectancy is known as a (an)
- a. life table.
 - b. mortality table.
 - c. survivorship table.
 - d. rate table.
 - e. insurance table.

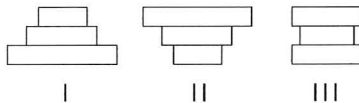
Use the survivorship curves in the figure below to answer the following questions.



- _____ 4. Which curve best describes survivorship in oysters?
- A
 - B
 - C
 - D
 - E
- _____ 5. Which curve best describes survivorship in humans who live in developed nations?
- A
 - B
 - C
 - D
 - E
- _____ 6. Which curve best describes survivorship in squirrels?
- A
 - B
 - C
 - D
 - E
- _____ 7. Life history strategies usually result from
- environmental pressures.
 - natural selection.
 - conscious choice.
 - A and B only
 - A, B, and C
- _____ 8. Which of the following aspects of an organism's life is *least* relevant to its life history?
- number of offspring per reproductive bout
 - age at which it first reproduces
 - frequency of reproduction
 - frequency of dispersal
 - all of the above

- _____ 9. A population of ground squirrels has an annual per capita birth rate of 0.06 and an annual per capita death rate of 0.02. Estimate the number of individuals added to (or lost from) a population of 1,000 individuals in one year.
- 120 individuals added
 - 40 individuals added
 - 20 individuals added
 - 400 individuals added
 - 20 individuals lost
- _____ 10. As N approaches K for a certain population, which of the following is predicted by the logistic equation?
- The growth rate will not change.
 - The growth rate will approach zero.
 - The population will show an Allee effect.
 - The population will increase exponentially.
 - The carrying capacity of the environment will increase.
- _____ 11. In which of the following habitats would you expect to find the largest number of K -selected individuals?
- an abandoned field in Ohio
 - the sand dunes south of Lake Michigan
 - the rain forests of Brazil
 - south Florida after a hurricane
 - a newly emergent volcanic island
- _____ 12. All of the following characteristics are typical of an r -selected population *except*
- occurrence in variable environments.
 - high intrinsic rate of growth.
 - onset of reproduction at an early age.
 - extensive parental care of offspring.
 - occurrence in open habitats.
- _____ 13. You are studying a population of finches on one island in an archipelago. You find that your population is much larger than you would predict from your careful recording of hatching, fledgling, and death rates. The likely explanation for this observation is
- you are dealing with a metapopulation.
 - your island is the source of emigration.
 - your island is the target of immigration.
 - A and C only
 - A, B, and C

The following questions refer to the figure below, which depicts the age structure of three populations.



- _____ 14. Which population appears to be stable?
- I
 - II
 - III
 - I and II
 - II and III

- _____ 15. Assuming these age-structure diagrams describe human populations, in which population is unemployment likely to be most severe in the future?
- I
 - II
 - III
 - No differences in the magnitude of future unemployment would be expected among these populations.
 - It is not possible to infer anything about future social conditions from age-structure diagrams.
- _____ 16. Which of the following is *not* used in calculating an ecological footprint?
- arable land
 - pasture and forest lands
 - fossil energy land
 - demographically transitional land
 - built-up land
- _____ 17. Which of the following variables is (are) important in contributing to the rapid growth of human populations?
- the high percentage of young people relative to the whole population
 - the average age to first give birth
 - the carrying capacity of the environment
 - A and B only
 - A, B, and C
- _____ 18. The presence of all of the following tend to increase species diversity *except*
- competitive exclusion.
 - keystone predators.
 - patchy environments.
 - moderate disturbances.
 - migration of populations.
- _____ 19. According to the competitive exclusion principle, two species cannot continue to occupy the same
- habitat.
 - niche.
 - territory.
 - range.
 - biome.
- _____ 20. The sum total of an organism's interaction with the biotic and abiotic resources of its environment is called its
- habitat.
 - logistic growth.
 - biotic potential.
 - microclimax.
 - ecological niche.
- _____ 21. All of the following describe possible results of competition between two species *except*
- competitive exclusion.
 - aposematic coloration.
 - resource partitioning.
 - reduction in the population of one species.
 - reduction in the populations of both species.

- _____ 22. Resource partitioning would be most likely to occur between
- sympatric populations of a predator and its prey.
 - sympatric populations of species with similar ecological niches.
 - sympatric populations of a flowering plant and its specialized insect pollinator.
 - allopatric populations of the same animal species.
 - allopatric populations of species with similar ecological niches.
- _____ 23. Which of the following terms best describes the interaction between termites and the protozoans that feed in their gut?
- commensalism
 - mutualism
 - competitive exclusion
 - ectoparasitism
 - endoparasitism
- _____ 24. All of the following are terms that ecologists use to describe communities *except* for
- species richness.
 - species diversity.
 - Batesian diversity.
 - trophic structure.
 - stability.
- _____ 25. The species richness of a community refers to the
- number of food chains.
 - number of different species.
 - energy content of all species.
 - relative numbers of individuals in each species.
 - total number of all organisms.
- _____ 26. The dominant species in a community is
- characterized by very large individuals with long lives.
 - the best competitor in the community.
 - the best predator in the community.
 - the population with the most biomass.
 - the most energetically efficient species in the community.
- _____ 27. In a tide pool, 15 species of invertebrates were reduced to eight after one species was removed. The species removed was likely a(n)
- community facilitator.
 - keystone species.
 - herbivore.
 - resource partitioner.
 - mutualistic organism.
- _____ 28. Elephants are not the most common species in African grasslands. The grasslands contain scattered woody plants, but they are kept in check by the uprooting activities of the elephants. Take away the elephants, and the grasslands convert to forests or to shrublands. The newly growing forests support fewer species than the previous grasslands. Elephants can be defined as what type of species in this community?
- redundant
 - dominant
 - keystone
 - dominant and keystone
 - none of the above

- _____ 29. Disturbances to ecological communities
- a. are frequently related to human activities.
 - b. can remove organisms and alter resource availability.
 - c. can create vacated ecological niches that other species can colonize.
 - d. All of the above are true.
 - e. Only A and B are true.

Refer to the list of terms below to answer the following questions. Each term may be used once, more than once, or not at all.

- A. parasitism
- B. mutualism
- C. inhibition
- D. facilitation
- E. commensalism

- _____ 30. the relationship between ants and acacia trees
- a. A
 - b. B
 - c. C
 - d. D
 - e. E

- _____ 31. successional event in which one organism makes the environment more suitable for another organism
- a. A
 - b. B
 - c. C
 - d. D
 - e. E

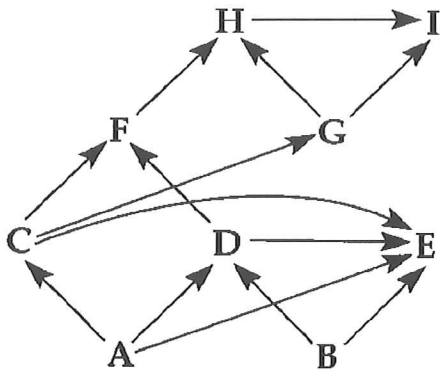
- _____ 32. There are more species in tropical areas than in places farther from the equator. This is probably a result of
- a. fewer predators.
 - b. a longer growing season.
 - c. fewer major disturbances.
 - d. B and C only
 - e. all of the above

- _____ 33. Which of the following best explains why energy cannot cycle through an ecosystem?
- a. the law of conservation of energy
 - b. the second law of thermodynamics
 - c. the competitive exclusion principle
 - d. the green world hypothesis
 - e. the principle of biomagnification

- _____ 34. Production, consumption, and decomposition are important ecosystem processes. Which of the following could be decomposers?
- a. bacteria
 - b. vertebrates
 - c. invertebrates
 - d. A and C only
 - e. A, B, and C

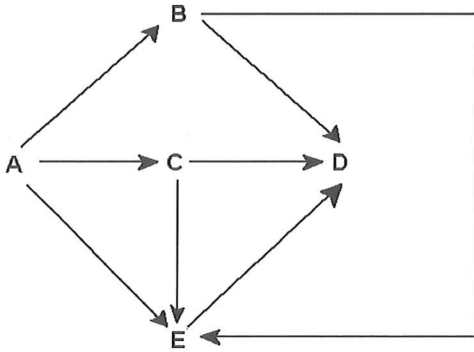
- _____ 35. Aquatic ecosystems are unlikely to be limited by insufficient
- nitrogen.
 - carbon.
 - phosphorus.
 - iron.
 - sodium.

Refer to the figure below, a diagram of a food web, for the following questions. (Arrows represent energy flow and letters represent species.)



- _____ 36. If this were a terrestrial food web, the combined biomass of C + D would probably be
- greater than the biomass of A.
 - less than the biomass of H.
 - greater than the biomass of B.
 - less than the biomass of A + B.
 - less than the biomass of E.

Use the figure below to answer the following questions. Examine this food web for a particular terrestrial ecosystem. Each letter is a species. The arrows represent energy flow.



- _____ 37. Excluding the decomposer, biomass would probably be smallest for which species?
- A
 - B
 - C
 - D
 - E

The following questions refer to the terms below. Each term may be used once, more than once, or not at all.

- green world hypothesis
- turnover
- biological magnification
- greenhouse effect
- cultural eutrophication

- _____ 38. CO₂ and water vapor re-reflect infrared radiation back toward Earth
- A
 - B
 - C
 - D
 - E
- _____ 39. caused by excessive nutrient input into lakes
- A
 - B
 - C
 - D
 - E

- _____ 40. caused excessively high levels of DDT in fish-eating birds
- A
 - B
 - C
 - D
 - E
- _____ 41. Estimates of current rates of extinction
- indicate that we have reached a state of unstable equilibrium in which speciation and extinction rates are approximately equal.
 - suggest that one-half of all animal and plant species may be gone by the year 2100.
 - indicate that rates may be 1,000 times higher than at any other time in the last 100,000 years.
 - B and C only
 - A, B, and C
- _____ 42. Extinction is a natural phenomenon. It is estimated that 99% of all species that ever lived are now extinct. Why then do we say that we are now in a biodiversity crisis?
- Humans are ethically responsible for protecting endangered species.
 - Scientists have finally identified most of the species on Earth and are thus able to quantify the number of species becoming extinct.
 - The current rate of extinction is as much as 1,000 times higher than at any other time in the last 100,000 years.
 - Humans have greater medical needs than at any other time in history, and many potential medicinal compounds are being lost as plant species become extinct.
 - Most biodiversity hot spots have been destroyed by recent ecological disasters.
- _____ 43. Which of the following would not qualify as an ecosystem service?
- rain falling to the ground
 - blowfly larvae infesting a deer carcass
 - bees pollinating an apple tree
 - squirrels burying acorns
 - leaves falling on a forest floor
- _____ 44. Suppose you attend a town meeting at which some experts tell the audience that they have performed a cost-benefit analysis of a proposed transit system that would probably reduce overall air pollution and fossil fuel consumption. The analysis, however, reveals that ticket prices will not cover the cost of operating the system when fuel, wages, and equipment are taken into account. As a biologist, you know that if ecosystem services had been included in the analysis the experts might have arrived at a different answer. Why are ecosystem services rarely included in economic analyses?
- Their cost is difficult to quantify.
 - They are not worth much.
 - People take them for granted.
 - A and C only
 - A, B and C
- _____ 45. Which of the following most directly relates to the current biodiversity crisis?
- increased atmospheric carbon dioxide
 - ozone depletion
 - overexploitation of species
 - habitat destruction
 - zoned reserves

- _____ 46. Which of the following is *not* an example of an introduced species?
- a. brown tree snakes in Guam
 - b. timber wolves in Minnesota
 - c. zebra mussels in the Great Lakes
 - d. kudzu plants in the southern United States
 - e. starlings in New York
- _____ 47. Introduced species
- a. are a problem because they can prey on or outcompete native species.
 - b. are sometimes present as a result of attempts at biological control.
 - c. are sometimes accidentally transported to new environments.
 - d. A and B only
 - e. A, B, and C
- _____ 48. Which of the following does *not* represent a potential threat to biodiversity?
- a. importing a European insect into the United States to control an undesirable weed
 - b. building a new mall on a previously unoccupied piece of midwestern prairie
 - c. letting previously used farmland go fallow and begin to fill with weeds and shrubs
 - d. harvesting all of the oysters from an oyster bed off the Atlantic coast
 - e. shooting wolves because they pose a threat to ranch cattle
- _____ 49. Which of the following does *not* apply to the concept of the extinction vortex?
- a. Populations of the species entering it are small.
 - b. The key factor driving the extinction vortex is intraspecific competition.
 - c. The genetic variation of the species' population decreases.
 - d. It is a concept developed by conservation biologists who adopt the "small population approach."
 - e. Interbreeding leads to smaller populations, which leads to more interbreeding, and so on.
- _____ 50. Which of the following conditions is the *most* likely indicator of a population in an extinction vortex?
- a. The population is divided into smaller populations.
 - b. The species is rare.
 - c. The effective population size of the species falls below 500.
 - d. Genetic measurements indicate a continuing loss of genetic variation.
 - e. The population is no longer connected by corridors.
- _____ 51. Forest fragmentation is likely to result in
- a. a loss of species that live in open habitat.
 - b. an increase in species that live in open habitat.
 - c. a loss of species that live in the interior of forests.
 - d. B and C only
 - e. A, B, and C
- _____ 52. After a disturbance, natural recovery of a biological community is most strongly influenced by
- a. whether the disturbance has been caused by humans or a natural agent.
 - b. the spatial scale of the disturbance.
 - c. whether the site is in temperate or tropical areas.
 - d. the availability of water nearby.
 - e. the season in which the disturbance occurred.

MYP Ecology Part II Formative

Answer Section

MULTIPLE CHOICE

- | | |
|------------|-------------------|
| 1. ANS: C | TOP: Concept 52.1 |
| 2. ANS: A | TOP: Concept 52.1 |
| 3. ANS: A | TOP: Concept 52.1 |
| 4. ANS: E | TOP: Concept 52.1 |
| 5. ANS: A | TOP: Concept 52.1 |
| 6. ANS: C | TOP: Concept 52.1 |
| 7. ANS: D | TOP: Concept 52.2 |
| 8. ANS: D | TOP: Concept 52.2 |
| 9. ANS: B | TOP: Concept 52.3 |
| 10. ANS: B | TOP: Concept 52.4 |
| 11. ANS: C | TOP: Concept 52.4 |
| 12. ANS: D | TOP: Concept 52.4 |
| 13. ANS: D | TOP: Concept 52.5 |
| 14. ANS: C | TOP: Concept 52.6 |
| 15. ANS: A | TOP: Concept 52.6 |
| 16. ANS: D | TOP: Concept 52.6 |
| 17. ANS: D | TOP: Concept 52.6 |
| 18. ANS: A | TOP: Concept 53.1 |
| 19. ANS: B | TOP: Concept 53.1 |
| 20. ANS: E | TOP: Concept 53.1 |
| 21. ANS: B | TOP: Concept 53.1 |
| 22. ANS: B | TOP: Concept 53.1 |
| 23. ANS: B | TOP: Concept 53.1 |
| 24. ANS: C | TOP: Concept 53.2 |
| 25. ANS: B | TOP: Concept 53.2 |
| 26. ANS: D | TOP: Concept 53.2 |
| 27. ANS: B | TOP: Concept 53.2 |
| 28. ANS: C | TOP: Concept 53.2 |
| 29. ANS: D | TOP: Concept 53.3 |
| 30. ANS: B | TOP: Concept 53.1 |
| 31. ANS: D | TOP: Concept 53.3 |
| 32. ANS: D | TOP: Concept 53.4 |
| 33. ANS: B | TOP: Concept 54.1 |
| 34. ANS: E | TOP: Concept 54.1 |
| 35. ANS: B | TOP: Concept 54.2 |
| 36. ANS: D | TOP: Concept 54.3 |
| 37. ANS: D | TOP: Concept 54.3 |
| 38. ANS: D | TOP: Concept 54.5 |
| 39. ANS: E | TOP: Concept 54.5 |

- | | |
|------------|-------------------|
| 40. ANS: C | TOP: Concept 54.5 |
| 41. ANS: C | TOP: Overview |
| 42. ANS: C | TOP: Overview |
| 43. ANS: A | TOP: Concept 55.1 |
| 44. ANS: D | TOP: Concept 55.1 |
| 45. ANS: D | TOP: Concept 55.1 |
| 46. ANS: B | TOP: Concept 55.1 |
| 47. ANS: E | TOP: Concept 55.1 |
| 48. ANS: C | TOP: Concept 55.1 |
| 49. ANS: B | TOP: Concept 55.2 |
| 50. ANS: D | TOP: Concept 55.2 |
| 51. ANS: D | TOP: Concept 55.3 |
| 52. ANS: B | TOP: Concept 55.4 |