

Multiple Choice (1 point each)

1. D Which of these pyramids can never be inverted?
 - a. standing crop of energy
 - b. biomass
 - c. numbers
 - d. rate of energy flow
 - e. all of these can be inverted

2. C What does species richness measure?
 - a. the overall biodiversity in an area of study
 - b. the relative abundance of each species in the area of study
 - c. the total number of different species present in an area of study
 - d. the most productive species in an area of study
 - e. none of the above

3. A Gross annual production is _____.
 - a. the solar energy captured by plants annually
 - b. the solar energy captured by plants annually minus respiration loss
 - c. the solar energy captured by plants annually minus energy consumed by animals
 - d. the solar energy captured by plants annually minus the energy consumed by decomposers
 - e. none of the above

4. B The flora and fauna to the west of Wallace's Line most recently originated in:
 - a. Australia
 - b. Asia
 - c. Africa
 - d. South America
 - e. the Arctic Circle

5. B What do you call a group that shares a derived characteristic or characteristics and has a recent common ancestor, but does not include all descendents of that ancestor?
 - a. Monophyletic
 - b. paraphyletic
 - c. polyphyletic
 - d. plesiomorphic
 - e. polarized

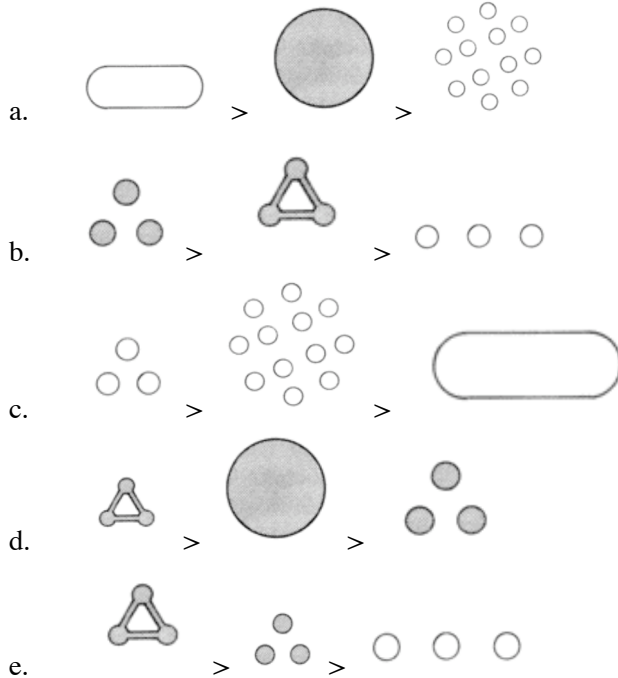
6. B Net productivity is:
 - a. the solar energy captured by plants
 - b. the solar energy captured by plants minus respiration loss
 - c. the solar energy captured by plants minus energy consumed by animals
 - d. the solar energy captured by plants minus the energy consumed by decomposers
 - e. none of the above

7. A What level of biodiversity would you predict for an ecosystem with a moderate level of disturbance?
 - a. It has high diversity.
 - b. It has low diversity.
 - c. It is as diverse as an ecosystem experiencing a high level of disturbance.
 - d. Diversity is unaffected by disturbance.
 - e. None of the above.

8. D Which of the following is the traditional ecological viewpoint?
 - a. low diversity ecosystems are moderately stable

- b. high diversity ecosystems are less stable
- c. ecosystems of intermediate diversity are most stable
- d. ecosystems of low diversity are least stable
- e. none of the above

9. E Which shows the desirability of nature preserve shape, from greatest to least desirable?



10. B How many trophic levels are typically observed in most communities?

- a. no more than three
- b. four or five
- c. six or seven
- d. eight or nine
- e. none of the above

Definitions (2 points each):

11. Phylogenetic Systematics

the study of evolutionary relatedness among various groups of organisms, and classifying organisms based on their evolutionary relationships.

12. Paraphyly

a phylogenetic grouping that contains its most recent common ancestor but does not contain all the descendants of that ancestor.

13. Macrodescriptor

a measurement or characteristic used to describe and compare communities

Definitions (continued)

14. Principal Component

Principal component analysis (PCA) involves a mathematical procedure that transforms a number of possibly correlated variables into a smaller number of uncorrelated variables called principal components. The first principal component accounts for as much of the variability in the data as possible, and each succeeding component accounts for as much of the remaining variability as possible.

15. Biogeochemical Cycle

a pathway by which a chemical element or molecule moves through both biotic and abiotic compartments of Earth.

16. Connectance

the number of connections in a food web relative to the number of species in the food web, or the proportion of all possible links actually realized in a given food web.

17. Guild

groups of species that exploit the same resources in the same way[1], therefore sharing a similar ecological niche.

18. Standing crop

quantity or total weight or energy content of the organisms which are in a particular location at a particular time.

19. Secondary succession

occurs after disturbances that are not intense enough to kill all species. Regeneration can occur by re-sprouting/germination of seeds, and by introduction of species from elsewhere.

20. Evolutionary convergence

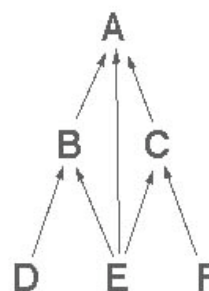
acquisition of the similar biological traits in unrelated lineages.

21. Nutrient Mosaic Hypothesis

Nutrients required by one species are used up in that area, making it unsuitable for colonization by the same species. Eventually, the nutrients will be replenished, allowing that species to return over time. Habitat/soil heterogeneity allows for coexistence of many different species, as it increases niche diversity.

22. Draw the food web that corresponds to the following community matrix (7 points):

	A	B	C	D	E	F
A	-1	+	+	0	+	0
B	-	-1	-	+	+	0
C	-	-	-1	0	+	+
D	0	-	0	-1	-	-
E	-	-	-	-	-1	-
F	0	0	-	-	-	-1

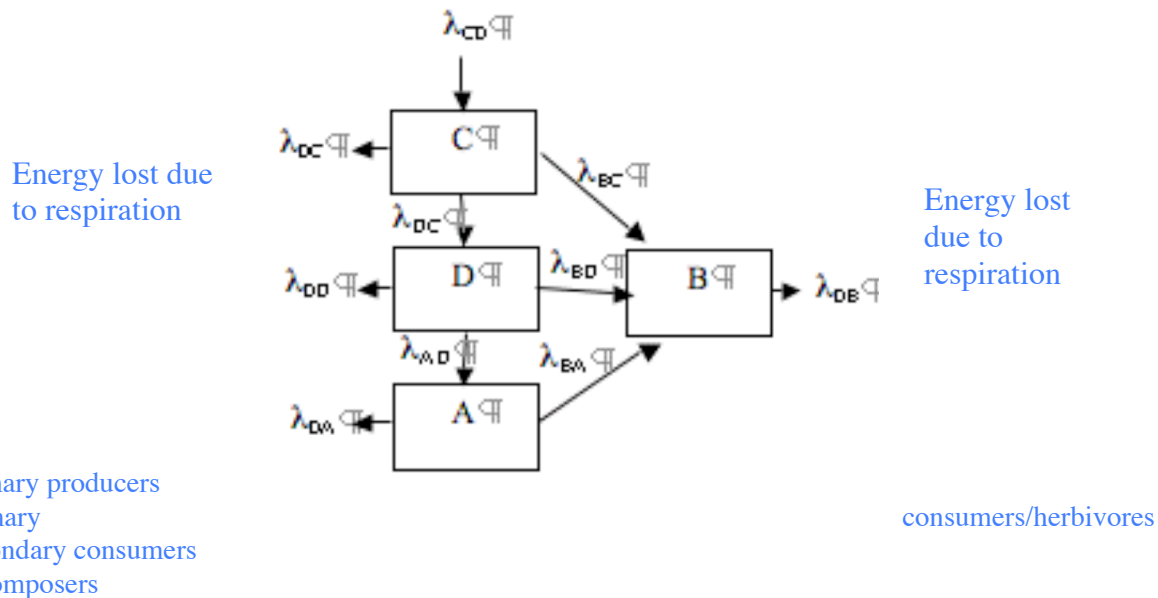


23. Draw diagrams and describe three different kinds of stability. (6 points)

see p402-405

24. In the diagram below label each trophic level and describe what the arrows are indicating in each instance. (14 points)

Energy input from Sun



Arrows between boxes = energy transfer between trophic levels.

25. What is the equilibrium theory of island biogeography? What trends do we expect to see, based on this theory? (6 points)

see pgs. 416-421

26. What global trends do we see in species diversity? Explain why we might see such trends. (6 points)

see pgs 394-402

27. Explain what a pseudocommunity is, give an example, and explain how they can be useful in community ecology. (6 points)

See pages 368-379

28. What is a “strange attractor”? Give an example. (6 points)

A “strange attractor” is a form of cyclic stability based on non-linear dynamic or so-called “chaotic” systems that oscillate within a constrained space but never return to the same state

29. Describe the methods and major results of Sir Lord Robert May, FRS’s studies of model communities. (6 points)

See pages 408-409

30. What is conservation biology and what are its major goals? (6 points)

See pages 424-429