

## Bio 213. Exam IV-A. Spring 2004.

The exam is worth 100 points. It consists of 40 multiple choice questions worth 2.5 points each. There are no extra-points. Read carefully each question and make sure you correctly fill your answer in the scantron. Also, fill in your name and **UT-eID** correctly. You have until 12:00 PM to work on your exam. **Hint:** Answer first all the questions you are confident of knowing, then concentrate on those that you are confused, finally guess on those that you do not know (you may get lucky). It was a pleasure to be your instructor for this course. Hope you learned something valuable for your future career. Have a great summer!

1. The structure of a community can be defined by any of the following properties, *except*:  
a) species richness    b) relative abundance    **c) primary production**    d) trophic guilds
2. One of the impacts associated with the current increase in CO<sub>2</sub> in the atmosphere is **a) an increase in the green house effect leading to higher average global temperatures.**  
b) a higher proportion of skin cancers and cataracts in humans.  
c) an increase in nutrient concentration across terrestrial water systems.
3. In a grassland community, cattle egrets and cowbirds feed on the insects flushed out by big herbivores. The interaction between birds and herbivores is classified as +/- in terms of its effect on the density of the species involved. Which type of interaction is it?  
a) mutualism            b) competition            **c) commensalism**            d) predation
4. A \_\_\_\_\_ species exerts strong control on community structure by having the highest abundance or biomass in a community.  
a) keystone    **b) dominant**    c) predator    d) mutualistic
5. In a \_\_\_\_\_ view of a community, species are interdependent of each other and are perceived as functioning like the body parts of a superorganism.  
**a) holistic**    b) individualistic    c) trophic cascade    d) functional
6. Among the different feeding positions of species within a community, \_\_\_\_\_ are groups of species that share the same method or location of foraging (eating).  
**a) trophic guilds**    b) trophic levels    c) trophic cascades    d) trophic structures
7. All of the following are examples of predator adaptations that enhance the ability of predators to catch prey, *except*  
a) acute senses    b) strong claws    c) ambush adaptations    **d) aposematic coloration**
8. One of the aims of this branch of ecology is to understand the factors that determine the number of species that can coexist within one place and how this number varies from place to place.  
a) Ecosystem ecology            b) Conservation biology            **c) Community ecology**

9. This type of food webs demonstrates feeding relationships among organisms.  
a) connectedness webs      b) energy flow webs      c) functional webs
10. As species diversity increases,  
a) the number of links per species in a food web stays the same.  
b) the number of links per species in a food web increases.  
c) the number of links per species in a food web decreases.
11. The law of Physics stating “some energy will be lost as heat in any conversion process” is readily applied in ecosystem ecology to understand  
a) energy transfer efficiency across trophic levels.    b) the absorption of sun light by primary producers.    c) the cycles of chemical elements.
12. The amount of light energy converted to chemical energy by the ecosystem’s autotrophs during a given period of time is known as  
a) primary production    b) secondary production    c) global energy budget
13. In marine ecosystems, primary production tends to be highest  
a) towards tropical latitudes  
b) along coastal areas  
c) in the open ocean
14. The type of ecosystem that contributes most to global primary production in large part because of its size is:  
a) open oceans    b) tropical rain forests    c) coral reefs    d) deserts
15. Amount of chemical energy in consumer’s food that the consumer converts to their own new biomass during a given period of time is called:  
a) primary production    b) net primary production    c) secondary production
16. The fraction of food energy not used for respiration by consumers is called:  
a) net secondary production    b) assimilation of primary production    c) production efficiency
17. Production efficiency is highest in organisms that use the least energy to sustain their own metabolism.  
a) True      b) False
18. Pyramids of \_\_\_\_\_ are used to depict energy flow relations among different trophic levels within ecosystems in terms of the total standing crop in each trophic level.  
a) production      b) numbers      c) biomass
19. All of the chemical elements below are considered to have a global chemical cycle, *except*:  
a) Carbon      b) Potassium    c) Oxygen      d) Sulphur

20. In the general model of nutrient cycling, the process(es) that facilitate the direct availability of nutrients from organic reservoirs where nutrients are unavailable to inorganic reservoirs where nutrients are available to organisms are:

a) erosion and burning of fossil fuels      b) fossilization      c) assimilation and photosynthesis

21. The \_\_\_\_\_ cycle is driven by physical processes rather than chemical ones.

a) Water      b) Nitrogen      c) Carbon      d) Phosphorus

22. In the \_\_\_\_\_ the nutrient of interest may become unavailable to organisms for long periods of time to organisms by sedimentation of new rocks.

a) Phosphorus cycle      b) Nitrogen cycle      c) Carbon cycle      d) Water cycle

23. \_\_\_\_\_ is the decomposition of organic Nitrogen to ammonia by fungi and bacteria.

a) Nitrification      b) Denitrification      c) Ammonification

24. The majority of N in most ecosystems is recycled globally by decomposition and reassimilation.

a) True      b) False

25. In a desert community, the relative abundance and distribution of the wood-rat (*Neotoma mexicana*) is limited by competition with the kangaroo rat (*Dipodomys merriami*). The wood rat species occupies its \_\_\_\_\_ within the community.

a) realized niche      b) fundamental niche      c) geographic range      d) cladistic niche

26. Which observation led Connell to *hypothesize* that the relative abundance and distribution of the small barnacle *Chthamalus* is limited through competition with the large barnacle *Balanus* in the rocky intertidal areas of Scotland?

a) Settlement of *Chthamalus* juveniles in the lower intertidal area, where *Balanus* is dominant, is fairly high.

b) When the two species share the same experimental rocks in the lower intertidal, *Balanus* dislodges *Chthamalus* from the rocks as it increases in size.

c) When *Chthamalus* is allowed to grow in experimental rocks in the absence of *Balanus* along the lower intertidal, the survival of *Chthamalus* is high.

27. All of the following statements about herbivores and parasites are correct, *except*:

a) Parasites do not affect the density of their host species, but predators affect the density of their prey.

b) Parasites tend to be very small relative to their host, and eat only certain tissues.

c) Predators kill their prey more quickly and consume all of it.

28. An example of a prey adaptation involving crypsis is  
a) a butterfly that resembles a leaf.  
b) the bright markings of a poisonous frog.  
c) the green color of a plant.  
d) a carnivorous fish with a wormlike tongue that lures prey.
29. An example of Batesian mimicry is  
a) the mottled coloring of moths that rest on lichens.  
b) a beetle that resembles a scorpion.  
c) two poisonous frogs that resemble each other in coloration.  
d) a butterfly that resembles a leaf.
30. All the following statements match the virulence adaptation with the correct parasite example, *except*:  
a) Parasites produce chemical depressants of host immune system. Example: AIDS virus.  
b) Parasites mimic host proteins. Example: schistosomes.  
c) Parasites coat themselves with host proteins. Example: schistosomes.
31. Parasitism and herbivory are similar in that both can be characterized as  
a) +/+ interactions    b) +/- interactions    c) -/- interactions    d) +/-0 interactions
32. An example of mutualism is  
a) The interaction between leaf-cutter ants growing fungi.  
b) The interaction between hitchhiking barnacles encrusted on baleen whales.  
c) The interaction between juvenile scrub jays helping adult scrub jays to reproduce.
33. The cost-benefit equation observed between species engaging in mutualistic interactions is constant through time.  
a) True    b) False
34. In the mutualistic interaction between treehoppers and ants discussed in class, the costs of the interaction exceed the benefits for the treehoppers when:  
a) The density of the spider preying on juvenile treehoppers decreases drastically.  
b) The density of the ants harvesting the honeydew produced by the treehoppers increases drastically.  
c) The density of the juvenile treehoppers increases drastically.
35. According to the concept of competitive exclusion,  
a) a species occupies a realized niche that is different from its fundamental niche.  
b) two species cannot coexist in the same habitat.  
c) two species cannot share the exact same niche in a community.  
d) competition within a population results in the success of the best-adapted individuals.

36. Extinction and ecological disturbance are natural phenomena. According to what was discussed in class, why, then do we say that we are now in a biodiversity crisis?

- a) Because humans feel ethically responsible for protecting endangered species
- b) Because most diversity hot spots have been destroyed by recent ecological disasters
- c) Because many potential medicinal compounds are being lost as plant species become extinct
- d) Because the current rate of extinction is much higher than in the past.**

37. What is an introduced species?

- a) A species that colonizes a new geographical area with the aid of humans.**
- b) A species that naturally colonizes a new community.
- c) A species that has great capacity for dispersal, survival and reproduction.

38. In this component of biodiversity, the loss of diversity is mainly driven by the extinction of populations.

- a) Genetic diversity**   b) Species diversity   c) Ecosystem diversity

39. Ecosystem services, health, industry and aesthetic benefits are all benefits provided to human society by biodiversity.

- a) True**                      b) False

40. The major threat to biodiversity is

- a) overexploitation.   **b) habitat destruction.**                      c) introduced species.