

Bi 253 Sample Exam Questions – **correct answers in bold**

Exam 4 - Ecology

1. The Mojave Desert sits at about 35° N. latitude. It is a desert because there is little rainfall, but it is also very hot. Why so hot?
 - a. Due to the tilt of the earth, there is more solar radiation striking 30-35° than other latitudes.
 - b. There is a broad band of thinner atmosphere at this latitude (N and S) so that more radiation can penetrate to the ground.
 - c. In a year there are more hours of daylight at this latitude compared with others.
 - d. Sinking cold, dry air (originally from the equator) heats up as it falls and slams into the earth at around 30-35° N and S latitudes.**
 - e. a & c

2. In natural (not altered by humans) biomes, which of the following is the most critical factor limiting plant growth?
 - a. Sunlight
 - b. Soil nutrients
 - c. Water**
 - d. Transpiration
 - e. Carbon dioxide

3. In which of the following biomes would you expect the greatest above-ground biomass?
 - a. Rain forest
 - b. Boreal forest
 - c. Grassland
 - d. Tundra
 - e. a & b**

4. Which of the following ecological regions has the slowest transit time for carbon?
 - a. Tropical rain forest
 - b. Littoral zone
 - c. Bog**
 - d. Oligotrophic lake

5. The term $(K-N)/K$ of the logistic growth equation...
 - a. Is only relevant for r-selected organisms
 - b. Is only relevant for K-selected organisms
 - c. Is a density-independent factor
 - d. Does not take into account the size of the population
 - e. None of the above**

6. Recall the population dynamic for the lynx and hare in Canada. Suppose there is a change in the ecosystem (perhaps climate change) such that the *magnitude of the oscillation* for both the lynx and hare populations becomes much larger. What is a likely consequence of this perturbation?
- It would lead to greater average stability of the two populations
 - There is a greater risk of local extinction for one or both populations**
 - The hare population is likely to stabilize more than the lynx population
 - There would be no real consequence over a number of years.
7. The age distribution for a population of an r-selected organism would be...
- Pyramidal**
 - Rectangular
 - An inverse pyramid
 - Bimodal
8. The fact that you find **giant** *Anolis* lizards on islands of the Lesser Antilles (in the Caribbean) is an example of...
- siderosis
 - adaptive radiation**
 - mimicry
 - allelic dysentery
9. In the Panamanian forest, which of the following best describes the situation for Bot flies?
- They occupy a realized niche smaller than their fundamental niche.
 - They have a mutualistic relationship with Oropendolas.
 - They are brood parasites.
 - In shady regions wasps that spot Bot flies, but not hot Bot flies, cannot stop their demise, thus the bot flies rot.
 - None of the above**
10. Since there is so much nitrogen available in the atmosphere (70% of air is N_2), this element tends not to be a critical or limiting nutrient for plants.
- true
 - false**

11. If large carnivores in an ecosystem are killed off, the number of primary producers in the area may also decrease dramatically, even though the carnivores don't eat the primary producers. How do you explain this effect?
- It is the result of a trophic inversion.
 - The death of the carnivores leads to increased decomposition which pollutes the primary producers.
 - The carnivores are most likely keeping the herbivore population in check.**
 - Angular stratification of the grazer biome is retrofied when the carnivores are killed.
12. Given the story of Brown Tree snakes in Guam, would you say that introduced species...
- are readily controlled if the right combination of techniques are employed.
 - typically die out after a few generations because conditions are never identical to the natural habitat of the introduced plant or animal.
 - can be well controlled, but only if the resources of a wealthy and technologically advanced country can be marshaled.
 - may be impossible to control even by a country with enormous resources.**
13. Toxins in the food chain are magnified as you go to higher and higher trophic levels. This is because...
- Higher tropic levels are mostly filled with many less-complex organisms so there are more individuals eating the toxins.
 - Most of the toxins released into the environment are consumed only by animals high on the food chain.
 - Many toxins are not cleared from tissues, so each animal that eats another retains a relatively small percentage of the carbon, nitrogen, etc but 100% of the toxins.**
 - Organisms higher on the food chain are larger, so the toxins are easier to see.
14. What is an aquifer?
- Any large body of standing water like a lake or ocean.
 - Water contained in underground reservoirs that are composed primarily of spaces between loosely compacted rock.**
 - The amount of surface run-off in a watershed
 - The water released by plants back to the atmosphere.
 - A representative of a group of marsupials that have blue coats.

15. Suppose you belong to a cult living the Southwest U.S. and as part of the cult beliefs you may only eat Roadrunners. These birds feed exclusively on snakes (not really, but we'll say so). The snakes are predators on Kangaroo Rats. K-rats are seed eaters. Your ration of Roadrunner in the cult headquarters compound amounts to one pound per day, which is barely enough food, but you can make it. About how many pounds of seeds per year must grow to sustain you?
- a. 30
 - b. 40
 - c. 10,000 (amazingly, this is the amount of seed that has to grow per day!)
 - d. 36,000
 - e. **Over 300,000**
16. Which of the following is the largest single factor in species loss?
- a. chemical pollution
 - b. thermal pollution
 - c. **habitat loss**
 - d. introduced species