

BIOS 209 - Fundamentals of Biology II

Sample Essay Questions

Short Essay—Read each question carefully and write an essay response.

1) Write an essay on social interactions between individual animals. In your essay, indicate three different ways, visual, auditory and chemical, by which animals “communicate” with each other. In general, explain how such systems of communication increase the fitness of the animal species.

2) Write an essay on human population growth. In your essay, name and describe the growth curve for the global human population. Also in your essay, define and describe the “demographic transition” that has been repeatedly observed in different countries. Finally, explain why the global human population size is not limited by a single carrying capacity in the same way that nonhuman species are usually limited.

3) Write an essay on mimicry. Define what is meant by the terms “mimic” and “model” as they are used by ecologists. In your essay, describe and distinguish Batesian mimicry from Mullerian mimicry, and give a specific example of organisms (common names are acceptable) having each of these types of mimicry. Finally, explain how natural selection controls the population size of the Batesian mimic compared to the population size of the model.

4) Write an essay on community ecology. In your essay, define the term “community.” List and describe four different general types of interactions that occur in ecological communities, and for each indicate how the interaction affects the fitness of each interacting species using the “+, 0, —” notation of your text. For two of the four interactions, give a specific example of a pair of interacting species (common names are acceptable) and how their interaction with each other in a natural ecological community affects fitness.

5) Write an essay on human impacts on the biosphere. In your essay, describe four specific ways that the human population is having a negative impact on ecosystems. For each of these, suggest an approach that might offer a partial solution to the specific negative impact.

6) Write an essay on conservation biology. In your essay, indicate two general approaches to conservation. Also in your essay, define the terms “biodiversity hotspot” and “landscape edge/edge species.” In each case, explain how

conservationists can apply the ecological concept towards a better conservation approach.