

Exam #4 May 5, 2010

Read each question carefully and don't hesitate to ask if a question seems unclear. If possible, answer each question in the space provided, but if needed, continue on the back. If you use a drawing as part of your answer, be sure to also include a written explanation. These questions have specific answers, although for some, more than one answer is possible. To receive full credit you must clearly and fully answer the question being asked. The points for each question are noted in parentheses totaling 100 points.

1. Would recycling plastic lead to an increase **or** decrease of contaminants in the environment? Why? (10 pts)

Decrease. Less plastic would end up in landfills allowing less plastic to leech contaminants into the environment. OR Increase. Plastics can only be recycled a few times, so the recycling will not remove anything from the waste stream while making plastics more palatable to consumers.

2. Would recycling be more important to someone using intrinsic values or someone using instrumental values? Why? (12 pts)

Intrinsic. Recycling, while it is expensive, saves land and resources for non-humans. OR Instrumental. The resources and space saved by recycling could help humans by reducing toxins and making the saved resources available to humans.

3. Could you use the same virus for genetically engineering people and goats? Why or why not? (10 pts)

No. Viruses are usually species specific. OR Yes. Some viruses, like rabies, can infect specific cells in several different species.

4. Mel is a forager ant that does not want to work today. So Mel decides to sneak back into the ant mound by acting like a patrol ant. Will his plan work? Why or why not? (12 pts)

No. The chemicals on Mel's surface will give him away as a forager. OR Yes. If he can change the chemicals on his surface, th other ants will see him as a patrol ant.

5. A researcher wants to study the emergent properties of a plan to geoengineer rainfall in Austin. What is **one** thing that they need to have in their study so that they are including the emergent properties of this plan? (10 pts)

Various answers. Should include connecting different aspects of the study to each other.

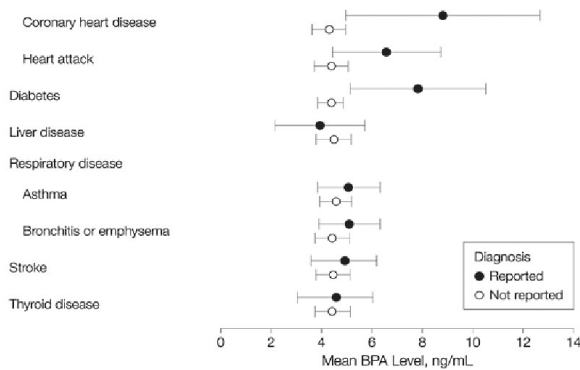
6. Educating women usually reduces birth rates, but in a hypothetical country, Notexististan, over the last 20 years the rate of womens' education has improved while the birth rate has remained high. How can this lack of a lower birth rate be explained in light of increased educational opportunities for women? (10 pts)

Even with increased education the women cannot find jobs, so they are still suffer from a lack of opportunities.

7. The plan to pull CO₂ out of the atmosphere and store it in marine photosynthetic organisms has not worked very well. What could be changed that would allow more CO₂ to be stored in marine photosynthetic organisms? How would this change help? (12 pts)

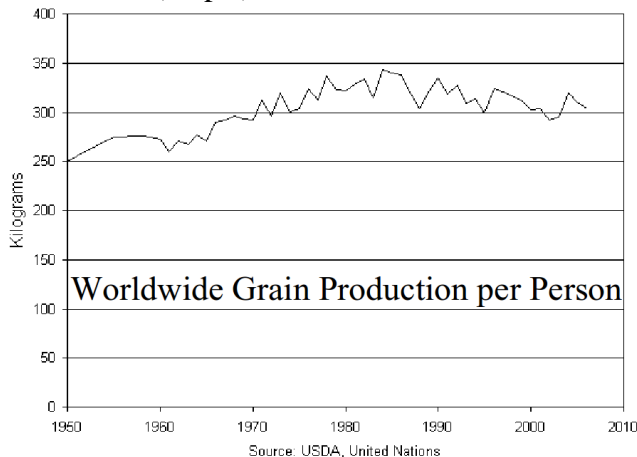
There needs to be a way to increase the producers, but without increasing consumers. If the producers are toxic or unpalatable to the consumers. If the producers are kept in some way separate from the consumers. If enough secondary consumers are maintained to keep primary consumer numbers very low.

8. What does this graph looking at BPA levels in people with and without certain diseases tell us about the safety of BPA? (12 pts)



Not much. It shows that people with some diseases, heart disease and diabetes, have higher levels of BPA, but we do not know if there is a direct connection. It could be that the high BPA levels are because of the disease or that high BPA is a symptom of these diseases, but not a cause.

9. This graph shows changes in worldwide grain production per year from 1950 to 2006. Predict how this graph will look over the next 50 years. Support your prediction with relevant and accurate information. (12 pts)



The line could go up if increases in grain production out pace increases in population growth. This could be because of a slow down in population growth or increases in agricultural efficiency from GM crops, etc. OR the line could stay even if increases in grain production stay even with increases in population growth. The population growth rate has been declining, and we are not likely to reach the limit of agricultural production in the next 50 years. OR The line may go down due to limits of agriculture with ever increasing population.