**Cunningham 6e CRITICAL THINKING ANSWERS**

**Chapter 1**

1. Apo Island’s marine sanctuary fits the model for sustainable development because it involves objective scientific study of the success of a no-fishing zone, it provides income and jobs for local people, and it represents an equitable sharing of resources. If you were a scientist evaluating this project, you’d probably try to obtain objective data to support or refute each of these claims.
2. There are many existential questions, such as What is the meaning of life? Is there life after death? or Do we have a right to kill others? That science can’t answer.
3. Keeping the identity of survey respondents secret from those who evaluate responses helps to maintain impartiality and objectivity. Still, if you believe, as many social scientists do, that there is no such thing as objective truth (other than the truth that there is no truth) in any field, then you probably believe that everything is socially constructed.
4. Are there enough resources? It depends on the patterns of production, consumption, and cooperation we adopt. It also depends on what you consider a decent, secure, happy life. As Paul Ehlich points out, the carrying capacity for saints might easily be 10 billion, but the number of selfish, wasteful, greedy, destructive individuals the world can tolerate is far lower. Some people believe that humans are perfectible and that we could all become saints. Others assume that most of us are unalterably flawed.
5. In studying the environmental impacts of a rich versus poor country, you ought to examine not only the local environment of each country, but also evaluate the impacts of extracting, shipping, and using resources from remote locations. In other words, what are the environmental impacts of wealthy lifestyles and political/economic systems on the countries that produce the goods and services they use?

**Chapter 2**

1. Obviously, the answer to this question depends on where you live. Are you familiar with the natural world around you? Have you considered both the biological community and the physical setting in describing your ecosystem? Are you defining only your immediate surroundings, or are you considering the wider world around you? Obviously, all ecosystems are open with regard to energy source (usually the sun), but what about other resources? Where does your water, air, food, building material, etc come from?
2. Did you think about rusting metal, machinery that wears out, water running down hill, death, or the impossibility of building a perpetual motion machine? Most of our disorganization is personal preference, but it does take energy to clean and organize, doesn’t it?
3. If chemical bonds were extremely strong, everything would be solid and there would be no motion. If all chemical bonds were extremely week, no structures could exist. Life would be impossible in either case.
4. You’d need to find a way to measure the biomass weight of the different plants, animals, microbes (and the accumulated organic material they produce that’s stored in sediments). For a very open system, you may need to devise a way to capture that leaves the system through rivers, air transport, or other ways that biomass escapes from the system.
5. Did you think of the carbon in wood, such as tree trunks? How about the carbon in soil or in living organisms? Which are the largest and longest lasting depends on where you live.