Bio 122 – Review Answers

***Chapters 7 & 8***

1. Darwin was a naturalist who set off on his voyage with the intention of studying the diversity of life on the planet. He was attempting to study animals and plants in their natural ecosystem, rather than as living or dead specimens taken out of their homes and brought back to Europe by travelers.
2. Artificial selection would take place if a breeder chose only to breed his fastest horses together, thus increasing the chances of having faster offspring. Over time, his herd would be primarily made up of faster and faster horses if he sold the slower ones without breeding them.
3. Fitness is the sum total of an organisms’ adaptations relating to its ecosystem. Organisms adapt to their environments slowly over time through random mutations and natural selection.
4. The fossil record gave Darwin a snapshot of life in the past, so that when organized chronologically, one could observe the changes in a particular group of organisms. In the same way, organisms could be traced back and their common ancestors identified.
5. Varied answers possible. Your answer should include something along the line of genetic change over time as a result of random mutations and natural selection, or a shift in the genetic frequency of alleles in a particular population.
6. Extinction depends on other patterns of evolution, such as adaptive radiation or punctuated equilibrium. The loss of life that stems from evolution is not a form of evolution, but it allows others patterns to emerge instead.
7. Homologous body structures are used as evidence to support evolution and to prove that organisms are descendant from common ancestors. Convergent evolution is not the result of common ancestry, but rather explains how different, unrelated organisms can evolve similar structures when faced with similar ecological pressures.
8. Evolution remains a theory because of the immense time span necessary to make the observations needed to prove it. If evolution occurs over millions of years, we have not been keeping accurate records long enough to have definitive proof, and the fossil record currently assembled has too many “holes”, or missing links to provide definitive proof.
9. Darwin did not publish his work immediately due to the controversial nature of its content. It would have been difficult for him to find the right way to explain his theories when they contradicted what people had believed for thousands of years.
10. A) A population is a group of inter-breeding individuals who live in the same physical location.

b) A species is a group of organisms that look alike and can successfully reproduce with one another (that is, produce fertile offspring).

c) The gene pool of a population is the sum total of all the genetic information contained in all the individuals of that population.

d) The relative frequency of an allele is the frequency at which is appears in the gene pool when compared to other alleles of the same gene.

e) Genetic equilibrium exists when the relative frequency of an allele does not change over time. In this case, a particular population would NOT be evolving.