**Symbiosis Practice Problems**

**1. A scientist was studying in the grasslands and noticed a strange species of bird called the oxpecker sitting on top of a zebra. After studying their relationship for several days, the scientist concluded that the zebra was groomed of unwanted ticks while the oxpecker received an easy meal sitting atop the zebra’s back. Also, when danger lurks, oxpeckers fly upward and scream a warning for all of the zebras in the area, providing a form of protection.**

a) What type of symbiosis was observed in the above example? How do you know? Be sure to include what effects each organism (zebra and oxpecker) receives from the relationship. (2 points)

b) Given the above relationship, if the population of oxpeckers were to decrease, what is one effect to the zebras we may expect to see and why? (2 points)

c) If the zebra did not have ticks on its back, and the oxpecker simply sat atop the zebra’s back as a habitat without positively or negatively affecting the zebra, what type of symbiosis would the relationship be considered and why? (2 points)

**2. Buster Tran (a dog) went for a swim in a nearby stream and unfortunately Mr. Tran forgot to check the waters for leaches! When Buster made it back to shore, he was covered in the blood sucking animals. They were clearly making Buster uncomfortable and without Mr. Tran’s help, would have been stuck for as long as the leach could manage to stay attached.**

a) What type of symbiosis was observed in the above example? How do you know? Be sure to include what effects each organism (dog and leaches) receives from the relationship. (2 points)

b) Why would a **mosquito** flying over to Buster and biting him in the nose **not** be considered a type of symbiotic relationship even though each organism receives the same types of effects as the above example? (what qualification of symbiosis is missing?) (2 points)

**3. Alexander Fleming was the scientist who discovered that a bread mold called penicillium released a toxin called penicillin that appeared to kill bacteria. The strange thing was, the penicillium did not gain from this relationship. It was as if the chemical the bread mold was releasing “accidentally” killed nearby bacteria. This relationship was observed time and time again throughout his long-term studies.**

a) What type of symbiosis was observed in the above example? How do you know? Be sure to include what effects each organism (bread mold and bacteria) receives from the relationship. (2 points)

b) What makes the above type of symbiosis **different** from mutualism, commensalism, or parasitism? (2 points)

c) If the penicillium bread mold **did** benefit from harming the bacteria around it, what type of symbiotic relationship would it now be considered and why? (2 points)

**Homework: Research and define the following words:**

**Abiotic factors:**

**Biotic factors:**

**Habitat:**

**Community:**

**Ecosystem:**

**Biome:**