**IES Midterm Practice Questions: Answer Guide**

1. Your friend wonders, “Do squirrels like acorns better or walnuts better?” Answer the following questions:  
   A) What might his hypothesis be?   
   **Sample: Squirrels like acorns better than walnuts.**  
     
   B) How could he set up his experiment? Be as clear as possible.  
   **Sample: He could set up two feeders in the same location, one with acorns and one with walnuts. Then he could watch the feeders for a day and count how many acorns are taken and how many walnuts are taken by squirrels.**
2. Put this list in order from **smallest** to **largest**:   
   population, cell, community, organism, biosphere, ecosystem  
   **cell, organism, population, community, ecosystem, biosphere**
3. Give an example of a biotic factor interacting with an abiotic factor.   
   **Sample: Deer drinking water; tree growing in soil**
4. Define niche and give an example.  
   **Niche:** **An organism’s job or lifestyle in an ecosystem**  
   **Example: Plants produce food for a community**
5. Define adaptation and give an example.  
   **An adaptation is a specific trait that allows an organism to survive in its environment. An example is that cactuses have adapted to conserve water in the dry desert.**
6. What are two specific reasons organisms depend on each other?   
   **Organisms depend on each other for food and shelter**
7. What biome do we live in?   
   **Deciduous forest**
8. How is the precipitation different in our home biome than in the rainforest?  
   \_\_**In the rainforest there is a lot more precipitation than there is in the deciduous forest.**

1. Fill in the table below:

|  |  |
| --- | --- |
| **Type of Species Interaction** | **Example** |
| Parasitism | **leech on a human, tapeworm in intestines, etc** |
| Predator/Prey | **lion eating a gazelle, mountain lion eating a deer, etc** |
| Commensalism | **Bird nesting in a tree, clownfish living in a sea anemone, etc** |
| Mutualism | **Bees pollinating flowers** |
| Competition | **Plants competing for light, two animals hunting the same prey, etc** |

1. Does the climatograph below describe a tundra or a rainforest? Explain your answer—your explanation should include both **temperature** and **precipitation**.  
     
     
   **This is a rainforest—the temperature is high and constant year round and there is consistently a lot of precipitation. A desert would be much drier.**
2. What is the difference between **autotrophs** and **consumers**?  
   **Autotrophs make their own food and consumers have to eat other organisms.**
3. Fill in the blanks to describe how energy flows through an ecosystem. Use the following words: decomposers, producers, the sun, consumers  
     
   All energy comes from \_\_\_**the Sun**\_\_\_\_\_\_\_\_\_. Organisms called \_\_\_**producers**\_\_\_\_\_\_\_\_\_\_ can use the sun’s energy to produce their own food. These organisms are eaten by \_\_\_**consumers**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. When organisms die, they are broken down by \_\_\_**decomposers**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, organisms that keep energy cycling in ecosystems.
4. How much of the energy available in the producer level of the food web will be transferred to herbivores? **10%**
5. Using all of the organisms listed below, and no other organisms, create a food web.   
   Organisms: mountain lion, oak tree, deer, grass, squirrel, hawk, snake

grass

Oak tree

Deer

Squirrel

Hawk

Snake

Mountain Lion

1. Write a paragraph explaining the water cycle.  
   **Answers must correctly use evaporation, condensation, and precipitation in complete sentences.**
2. Why is nitrogen fixation important?  
   **All organisms need nitrogen, but most organisms cannot use the free nitrogen in the atmosphere. Nitrogen fixation converts this free nitrogen into compounds organisms can absorb and use.**
3. Why is denitrification an important part of the nitrogen cycle?  
   **Denitrification puts free nitrogen back in the atmosphere, allowing the nitrogen cycle to keep moving.**
4. What kinds of organisms are able to use free nitrogen in the atmosphere?  
   **Bacteria**
5. List three ways that decomposers help ecosystems.  
   **Decomposers break down dead organisms, cycle nitrogen, and cycle energy**
6. How do carbon dioxide and oxygen cycle through an ecosystem? Use the terms **photosynthesis** and **cellular respiration** in your answer.  
     
   **Plants breathe in carbon dioxide and use it for photosynthesis. They release oxygen, which humans and other organisms breathe in for cellular respiration. Humans and other organisms exhale the carbon dioxide the plants need for photosynthesis.**
7. How can a disturbance cause change in an ecosystem?  
   **A disturbance, like a flood or a fire, can kill trees and other producers. This would have a serious impact on organisms that depend on the producers for food and shelter. Disturbances can also change the climate or the landscape, and this would have an impact on the types of organisms that could survive there.**
8. Give an example of how an organism can affect its environment.  
   **Example: Lichens produce acid, which can break down rocks.**
9. What is the difference between primary ecological succession and secondary ecological succession?  
   **Primary ecological succession happens in a location where there has never been an ecosystem; there is only bare rock. Secondary succession occurs in a location where there has recently been another ecosystem.**
10. Why are some organisms able to survive disturbances better than others?  
    **Organisms that are large and strong—like oak trees—are more likely to survive disturbances like serious storms or flooding. Organisms that can reproduce quickly—like insects—are able to more successfully repopulate after a disturbance.**
11. Why are lichens good pioneer organisms?  
    **Lichens are symbionts—the organism is really two organisms, fungus and algae. The algae can photosynthesize to provide the lichen with food, and unlike plants, lichens don’t need soil to put down roots. They can grow anywhere, even on bare rock.**
12. Explain the greenhouse effect and give an example of a greenhouse gas.  
    **The greenhouse effect is the term used to describe how the Earth’s atmosphere traps heat like a greenhouse. Carbon dioxide is the most important greenhouse gas; water vapor and methane are also greenhouse gases.**
13. List three human activities that are increasing the concentration of carbon dioxide in the atmosphere. **Deforestation, burning fossil fuels, building factories**
14. What evidence do scientists have that the Earth’s climate is changing over time?  
    **Scientists have tracked temperature over time and have found that it is increasing. They have also documented melting glaciers, rising sea levels, and shrinking ice caps.**
15. What are three of the predicted effects of climate change? **Longer summers, more droughts, less water, more insects, higher sea levels, more extreme storms**