**Topic 4: Conservation/Biodiversity & Topic 5: Pollution Management Study Guide**

**4.1 Biodiversity**

1. Explain the term **biodiversity** and why it should be protected.
2. Define **genetic** diversity.
3. Define **habitat** diversity.
4. Define the term **species** diversity.
5. Based on your definition from #3, use the following table to calculate the number of flowering species per unit area for each region in km2. SHOW YOUR WORK!

|  |  |  |
| --- | --- | --- |
| **Region** | **Surface area in km2** | **Estimated total number of species** |
| Amazon Basin | 7 050 000 | 30 000 |
| Northern Andes | 383 000 | 40 000 |
| Atlantic coastal forests of Brazil | 1 000 000 | 10 000 |
| Central America including Mexico | 2 500 000 | 19 000 |

1. Explain Darwin’s **theory of natural selection**. Use an example to support your explanation. (Hint: think of the beak activity we did in class).
2. What are the 4 factors that must be present in order for natural selection to occur?
3. What is **speciation** and how does it occur? Give a real life example of speciation.

**4.2 Evaluating Biodiversity**

1. What are the two main causes of extinction?
2. Give two example of natural causes of extinction.
3. Outline and describe the 5 human causes of extinction (**HIPPO**).
4. Give an example of an **invasive species** and explain the effect it has on the environment.
5. Define **background rate**.
6. List a few characteristics that make a species vulnerable.

**4.3 Conservation of Biodiversity**

1. Outline the 5 arguments for conserving a species.
2. Describe the role of national and international organizations in their effort to conserve species.
3. Explain how corridors attempt to conserve species.
4. Define **ecotone**.
5. Describe the significance of the **edge effect**.
6. What are 4 criteria that must be considered when designing a protected area?
7. Outline **three** characteristics that an area should have if it is to be designated a nature reserve or similar protected area. (Hint: you need to know the diagrams outlining “better” vs “worse” reserve designs. You can find this in your textbook on page 195).
8. State **two** examples of steps which are being taken to prevent further extinctions.

**5.1 Nature of Pollution**

1. Define **pollution**.
2. Distinguish between the terms **point source pollution** and **non-point source pollution** and give an example of each. Outline the challenges they present for management.
3. State the major sources of pollutants.

**5.2 Detection and Monitoring of Pollution**

1. Describe two **direct methods** of monitoring pollution.
2. Define the term **biochemical oxygen demand (BOD**) and explain how this indirect method is used to assess pollution levels in water.
3. Describe and explain an **indirect method** of measuring pollution levels using a biotic index.
4. Briefly describe an ecosystem you have studied, and name an ***abiotic***factor that influences the abundance of organisms within it. (Hint: think about your last IA on soil quality and water quality).

**5.3 Approaches to Pollution Management**

1. Outline the 3 step process of pollution management strategies.

1.

2.

3.

1. Describe the 3 factors that affect the approaches to pollution management.

1.

2.

3.

1. Explain the costs and benefits to society of the World Health Organization’s ban on the use of the pesticide DDT.
2. Identify one pro and one con for the use of DDT in LEDC’s.

**5.4 Eutrophication**

1. Outline the process of **eutrophication**. You may draw a picture to outline this process.
2. Explain the impacts of eutrophication.
3. Describe pollution management strategies in regards to eutrophication.

**5.5 Solid Domestic Waste**

1. Describe and explain 6 different sources of solid domestic waste (*landfill, incineration, composting, recycling, reduction, reuse*)

**5.6 Depletion of Stratospheric Ozone**

1. Explain how **stratospheric ozone** is formed. Be sure to state whether it is a renewable, non-renewable, or a replenishable resource. You may draw a picture to outline this process.
2. Define **CFCs** and explain where they are found and the effect the have on the stratospheric ozone.
3. Outline the overall structure and composition of the atmosphere. Complete the pie chart below. Make sure to label each section with the corresponding percentages.
4. Describe the role of ozone in the absorption of ultraviolet radiation.
5. Explain the interaction between ozone and halogenated organic gases.
6. State the effects of ultraviolet radiation on living tissues and biological productivity.
7. Describe the role of national and international organizations in reducing the use of ozone-depleting substances. Be sure to explain the purpose of the **1997 Montreal Protocol**.

**5.7 Urban Air Pollution**

1. State the source of **tropospheric (ground level) ozone**.
2. What are the effects of tropospheric ozone?
3. What is **photochemical smog**? How is it formed?
4. What are **VOCs**? Why are they harmful?
5. Describe pollution management strategies for urban air pollution.

**5.8 Acid Deposition**

1. Outline the process of the formation of **acid rain**. (You do not need specific chemical formulas). You may draw a picture to outline this process.
2. What is the difference between **wet deposition** and **dry deposition**?
3. Give an example of a **primary** pollutant associated with acid rain. Be sure to discuss the source of the pollutant.
4. Give an example of a **secondary** pollutant associated with acid rain and explain how they form.
5. Describe a direct effect, toxic effect, and nutrient effect of acid deposition on soil, water, and living organisms.
6. Explain why the effect of acid deposition is regional rather than global.
7. Describe pollution management strategies for acid deposition.
8. What is the calculation used to determine percent increase? Then, find the percent increase for the data points 250 and 400. SHOW YOUR WORK!