**APES- Chapter #15: Environmental Health, Pollution and Toxicology**

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Learning Objectives:** Serious environmental health problems and diseases may arise from toxic elements in water, air, soil, and even the rocks on which we build our homes. After reading this chapter, you should understand:

* *How the terms* ***toxic, pollution, contamination, carcinogen, synergism, and biomagnifications*** *are used in environmental health*
* *What the classification and characteristics are of major groups of pollutants of environmental toxicology*
* *Why there is controversy and concern about synthetic organic compounds such as dioxin*
* *Whether we should be concerned about exposure to human-produced electromagnetic fields*
* *What the dose-response concept is and how it relates to* ***LD-50, TD-50 and ED-50, ecological gradients, and tolerance***
* *How the process of biomagnifications works and why it is important in toxicology*
* *Why the threshold effects of environmental toxins are important*
* *What the process of risk assessment in toxicology is and why such processes are often difficult and controversial*
* *What the precautionary principle is and why it is important*

***Read: “Demasculinization and Feminization of Frogs in the Environment”***

1: What is **Atrazine**?

2: ***What problems*** does Atrazine cause in frogs?

3: What is a hormone disruptor? How is Atrazine a hormone disruptor? **Explain.**

4: What is a HAA? **Define.**

5: What is disease? *What factors cause disease?*

6: Explain what happened at Lake Nyos, Cameroon.

7: *Define the following*:

* Pollution:
* Contamination:
* Toxic:
* Toxicology:
* Carcinogen:
* Synergism:
* Point sources: **Give example:**
* Area sources (non-point): **Give example:**
* Mobile sources: **Give example:**

8: *Define the following: (Identify when they are used)*

* ppm:
* ppb:
* mg/L:
* μg/m3:

9: What is an ***Infectious Agent***? *(Give examples):*

10: What are some common heavy metals found in the environment? *What health hazards can they pose to humans?*

11: What is the concept of *Body Burden*?

What are the body burdens for the following?

* **Antimony:**
* **Mercury:**
* **Arsenic:**
* **Cadmium:**
* **Lead:**

12: Define ***biomagnification/bioaccumulation:***

13: Describe how *Cadmium* is a good example of biomagnification.

14: How does *Mercury* enter the environment?

15: Define ***Methylation:***

16: Define ***Volatilization:***

17: Define: *Persistent Organic Pollutant (POP)* and describe the properties that define them.

18: Give some examples of **HAA’s:**

19: Explain how PCB’s are harmful *(found in plastics*):

20: How can *Thermal Pollution* affect a body of water and it’s biodiversity? **Explain.**

21: What are ***examples of particulates***?

22: Why is **asbestos** harmful to humans?

23: How can ***EMF (Electromagnetic Fields)*** be harmful to humans?

24: How is ***noise pollution*** measured?

25: What are some ***voluntary exposures*** to pollutants?

26: What is meant by the quote, *“everything is poisonous, yet nothing is poisonous”*? **Explain.**

27: Describe the *“dose-response”.* **Draw and label** the generalized dose-response curve. **Explain each step.**

28: *Define the following:*

* **LD-50:**
* **ED-50:**
* **TD-50:**
* **LD-0:**

29: Explain the concept of a ***threshold dose***:

30: *Define:*

* **Behavioral tolerance:**
* **Physiological tolerance:**
* **Genetic tolerance:**

31: Explain the difference between an *acute and chronic effect*.

32: Explain the steps of **risk assessment**:

33: What is the *precautionary principle*?

Read: ***“Sudbury Smelters: A Point Source”*** on pg. 299

34: Summarize the environmental impacts of the smelter:

Read: ***“Mercury and Minamata, Japan”*** on pg. 303

35: What effect does mercury have on the environment:

Read: ***“Dioxin: The Big Unknown”*** on pg. 304

36: What is *Dioxin? Why is it so dangerous*?

Read: ***“Is Lead in the Urban Environment Contributing to Antisocial Behavior”***

37: What is the main point of the discussion about lead in the bones of children and behavior?

38: Why is it difficult to establish standards for acceptable levels of pollution? *In giving your answer, consider physical, climatological, biological, social, and ethical reasons.*