# Environmental Chemistry

## Unit C - Section 2

Name Class

1. Although clarity seems to be a good indicator of water quality, there are some problems with this way of determining water quality. One reason is because ...
   - **A. Clear water can often taste bitter**
   - **B. Pure spring water contains growth hormones**
   - **C. Clear water can have harmful acid in it**
   - **D. If it can't be seen, it's not there**

2. The type of indicator is used to determine the level of plant nutrients in a sample of water.
   - **A. biological organism**
   - **B. micro-biological organism**
   - **C. chemical indicator**
   - **D. invertebrates only**

3. **Calculate ppm (** You may use your calculator and do your rough work here **)**
   Food coloring was used for an experiment. 993ml of water was used with 16 drops ( 3ml ) of food coloring. What is the concentration of food coloring in **parts per million**?

   3ml per 1000ml of solution = .003 parts per 1000

   0.003 : 1000 = x : 1,000,000

   $\frac{0.003}{1000} = \frac{x}{1{,}000{,}000}$ $\frac{0.003}{1{,}000} \times 1{,}000{,}000 = \frac{x}{1{,}000{,}000} \times 1{,}000{,}000 =$ **3 ppm**

   - **A. 3 ppm**
   - **B. 3000 ppm**
   - **C. 16 ppm**
   - **D. 1600 ppm**

4. Only certain chemicals are measured in parts per billion and parts per trillion. One of these chemicals is PCB (polychlorinated biphenyl). The reason that its level is constantly monitored in ***parts per trillion*** is because the chemical …
   - **A. decomposes easily**
   - **B. reacts with organic compounds**
   - **C. magnifies up the food chain**
   - **D. magnifies down the food chain**

5. A freshwater biologist tested the level of dissolved oxygen in a section of the creek and found that it was quite low. The biologist was able to increase the level of dissolved oxygen by doing all of the following EXCEPT …
   - **A. planting additional water plants**
   - **B. adding blocks of ice to the water**
   - **C. placing large boulders downstream**
   - **D. placing large boulders upstream**

6. An organism that harms crops, people or structures is considered to be a …
   - **A. insect**
   - **B. parasite**
   - **C. bacteria**
   - **D. pest**

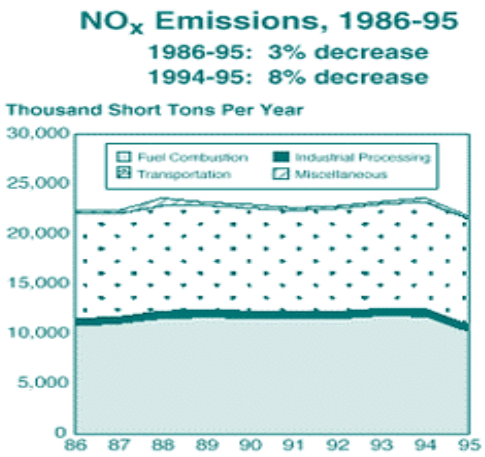
7. A correct explanation of this statement – "The LD50 of DDT is 87mg/kg, for rats, by mouth." is …
   - **A. 50 rats will die if they eat 87 mg of DDT**
   - **B. 50% of the test population of rats will die if given 87 mg of DDT**
   - **C. 50 rats will die if they are given less than the 87mg/kg of DDT**
   - **D. 50% of the rat test population will survive if given 87mg/kg of body weight of DDT**

8. Acid shock is an environmental event that causes serious harm to these …
   - **A. bacteria and fungi**
   - **B. eggs and young offspring**
   - **C. very old organisms**
   - **D. only mayflies and stoneflies**

9. It is now a well-known fact that mercury is a harmful heavy metal. Headbands on hats were treated in mercury before the harmful effects of mercury were known. This helps to explain the abnormal behavior of this character, from 'Alice In Wonderland' …
   - **A. The White Rabbit**
   - **B. The Queen of Hearts**
   - **C. The Calico Cat**
   - **D. The Mad Hatter**

10. Calcium sulfate (gypsum) is recovered when sulfur dioxide reacts with calcium carbonate. Another product is also produced, which many think is contributing to the depletion of the ozone. This product is …
    - **A. Hydrogen sulfide**
    - **B. Carbon dioxide**
    - **C. Chlorofluorocarbons**
    - **D. Nitrogen oxide**

11. The Nitrogen oxide graph on the right identifies the total amount of emissions between 1986 and 1995.




The decrease in $NO_x$ emissions in the graph between 1994 and 1995 indicates that there was a decrease of …
   - **A. 5 % in transportation only**
   - **B. 5 % in all emissions**
   - **C. 8 % in all emissions**
   - **D. 11% in all emissions**

12. The pollutant which is also identified as the 'silent killer' is …
    - **A. ozone**
    - **B. Carbon monoxide**
    - **C. Carbon dioxide**
    - **D. Sulfur dioxide**

13. From the list of pollutants provided,

nitrogen oxides sulfur dioxide carbon monoxide ozone lead particles organic pollutants

this one is a colorless, odorless gas composed of 3 oxygen atoms. At ground-level it forms from reactions between oxygen, nitrogen oxides and VOC's. The chemical pollutant is …

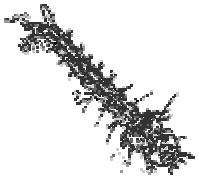
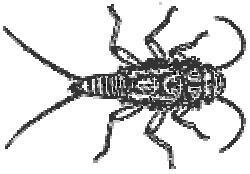
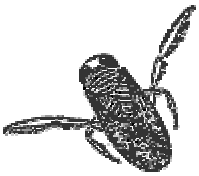
**A. ozone**
**B. Carbon monoxide**
**C. Nitrogen oxides**
**D. Sulfur dioxide**

14. Certain aquatic invertebrates are called biological indicators because they are indicators of water quality.

This biological indicator  is a …

**A. Midge larva**
**B. Stonefly larva**
**C. Water boatman**
**D. Mosquito larva**

15. Which of the following aquatic invertebrates is a stonefly larva?

**A.**  **B.**  **C.**  **D.** 

16. The amount of dissolved oxygen in the water supports different varieties of invertebrates. Which of the organisms in the question above would you likely find in water that has a dissolved oxygen level of 2?

**A. Midge larva**
**B. Stonefly larva**
**C. Water boatman**
**D. Mosquito larva**

17. The Greenhouse Effect is a natural occurrence, keeping the temperature of the Earth constant. The gases in the atmosphere …

**A. prevent energy from entering the atmosphere**
**B. trap energy in the upper atmosphere**
**C. reflect energy back into space**
**D. change energy into ozone**

18. In 1998 $SO_{2(g)}$ emissions in Canada were measured at 2696 kt. The prescribed limit on these emissions was 3200 kt. The percentage that $SO_{2(g)}$ was below the limit was ...

**A. 15.75 %**
**B. 84.25 %**
**C. 1.18 %**
**D. 98.82 %**

19. Chlorofluorocarbons contribute to the thinning of the ozone layer in the upper atmosphere. The sun's radiation breaks them down into this chemical that destroys ozone by reacting with it to form oxygen.

**A. methane**
**B. sulfur**
**C. chlorine**
**D. hydrogen**