

8. Draw the population pyramid of a population experiencing ZPG. (2 points)

9. Which of the following is true of a species such as mosquitos? (1 point)

- I. Survives best in stable environments.
- II. Population size is independent of density.
- III. Have long lifespans and produce few offspring.

- A. I only
- B. II only
- C. I and III only
- D. None of the above.

10. Which of the following cannot be a member of the first trophic level? (1 point)

- A. Plants
- B. Protists
- C. Bacteria
- D. Sun

11. In 2008, the population of New Zealand was approximately 4,275,000 people. If the birth rate was 14 births for every 1,000 people, approximately how many births occurred in New Zealand in 2008? (1 point)

- A. 6,000
- B. 42,275
- C. 60,000
- D. 140,000

12. List three trace elements that autotrophs absorb that are essential for life. (3 points)

13. What is the main difference between a food web and a food chain? (2 points)

14. Consider two forests: one is an undisturbed old-growth forest, while the other has recently been logged. In which forest are species likely to experience exponential growth, and why? (1 point)

- A. Old growth, because of stable conditions that would favor exponential growth of all species in the forest.
- B. Old growth, because each of the species is well established and can produce many offspring.
- C. Logged, because the disturbed forest affords more resources for increased specific populations to grow.
- D. Logged, because the various populations are stimulated to a higher reproductive potential.
- E. Exponential growth is equally probable in old-growth and logged forests.

II. Problems (Total Possible Points: 25)

1. Which is not a factor that environmental impact depends on? (1 point)
 - A. Population size
 - B. Impact of the resource
 - C. Per capita affluence
 - D. Destructive of the technologies used to produce that resource
2. List the three factors which determine the severity of the harmful effects of pollution. (3 points)
3. Twenty acres of prairie grass was cleared for agriculture. This is a cause of: (1 point)
 - A. Habitat fragmentation
 - B. Conversion
 - C. Intrusion
 - D. Human pollution
4. _____ composes the largest percentage of landfill makeup. (1 point)
 - A. Paper
 - B. Plastic
 - C. Metal/Glass
 - D. Organic
5. Which of the following statements best illustrates the concept of biomagnification? (1 point)
 - A. Methylmercury is easily absorbed by plankton.
 - B. Carbon dioxide levels in the atmosphere have been increasing exponentially ever since the inception of the Industrial Revolution.
 - C. Consumption of many lower-tier prey leads to significantly higher levels of a chemical in the predator.
 - D. Mercury causes brain damage in humans.
6. Which of the areas is most vulnerable to desertification? (1 point)
 - A. The Sahara
 - B. Eastern China
 - C. South Africa
 - D. Afghanistan
7. Which is not a cause of unsustainable water use? (1 point)
 - A. Leaky irrigation systems
 - B. Wasteful field application methods
 - C. Irrigation scheduling
 - D. Cultivation of crops unsuited for the environment
8. Over the past twenty years, urbanization in the United States is seen the greatest in: (1 point)
 - A. The Northeast
 - B. Puerto Rico
 - C. South
 - D. Urbanization is relatively consistent throughout the country.

9. Which is not a *major* cause of deforestation of the Amazon rainforest? (1 point)
- A. Cultivation of grain crops
B. Cattle ranching
C. Logging
D. Expansionist government policies
10. What is the difference between point and nonpoint source pollution? (2 points)
11. What is a green belt? (1 point)
12. What does RMW stand for (in terms of waste)? (1 point)
13. When would incineration be a more popular waste management method? (Provide an example of a country.) (2 points; 1 for the example, another for explanation)
14. Which environmental disaster resulted in the discharge of tailings into river system? (1 point)
- A) Minamata
B) Marcopper
C) Chernobyl
D) Cuyahoga River
15. True or false: Today, subsurface mining is a more common than is surface mining. (1 point)
16. Why are invasive species harmful to the environment? (1 point)
17. Which is not a secondary pollutant? (1 point)
- A. H_2SO_4
B. Ozone
C. NO
D. NO_2
18. Which of the following is not an ecological service that forests provide? (1 point)
- A. Storage of carbon
B. Habitat for species
C. Prevention of soil erosion
D. All are services.
19. Which country contains the largest amount of forested area? (1 point)
- A. Russia
B. Brazil
C. U.S.A.
D. Canada
20. List two possible effects of excessive use of fertilizers. (2 points)

III. Solutions (Total Possible Points: 40)

1. Define “sustainability.” (1 point)

Match the law or regulation to its correct description: (11 points; 1 point each)

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|---|---|
| 2. _____ Clean Air Act of 1970 | a. US government must develop a high level radioactive waste site by 2015 |
| 3. _____ Clean Water Act of 1972 | b. Controlling global warming by setting greenhouse gas emissions targets for developed countries. Not signed by the U.S. |
| 4. _____ Water Quality Act of 1965 | c. Trade alliance between U.S., Canada and Mexico |
| 5. _____ Montreal Protocol | d. Established national primary and secondary air quality standards. Set emission standards for cars, and limits for release of air pollutants. |
| 6. _____ Safe Drinking Water Act of 1974 | e. Moratorium on mineral exploration for 50 years in Antarctica |
| 7. _____ Earth Summit | f. Set maximum contaminant levels for pollutants that may have adverse effects on human health. |
| 8. _____ Kyoto Protocol | g. Set maximum permissible amounts of water pollutants that can be discharged into waterways and created pollutant discharge permits. Goal: To make all water swimmable and fishable. |
| 9. _____ Madrid Protocol | h. All states must have facilities to handle radioactive wastes. |
| 10. _____ North American Free Trade Agreement | i. Held in 1970's, discussed clean water and air. |
| 11. _____ Low Level Radioactive Policy Act | j. Attempt to reduce non-point source pollution |
| 12. _____ Nuclear Waste Policy Act | k. A plan to limit and eventually phase out ozone depleting substances (CFC's) |
13. List the two different basic methods of dealing with pollution and explain why which of the two is the better method. (4 points; 2 for methods, 1 for correct statement, 1 for explanation)

14. What factor does NOT determine how harmful a pollutant is? (1 point)

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|--------------------|-------------------|
| A. Chemical Nature | C. Degradability |
| B. Concentration | D. Preventability |

15. What is NOT an example of soil remediation? (1 point)

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|-----------------------|-------------------|
| A. Thermal desorption | C. Dredging |
| B. Excavation | D. Pump and Treat |

16. What is the method of stabilization in remediation? (1 point)
- A. It involves the addition of reagents to a contaminated material to produce more chemically stable constituents.
 - B. It involves the addition of reagents to a contaminated material to impart physical/dimensional stability to contain contaminants in a solid product and reduce access by external agents.
 - C. It involves altering the chemical structure of contaminated material so that it can be changed into a more stable constituent.
 - D. It involves taking away the harmful parts of contaminated material in order to produce a more stable product.
17. Active heating system is when _____ (1 point)
- A. The solar energy is converted directly to heat for use at the site of collection.
 - B. The solar energy is converted into heat, but the heat energy must be transferred from the region of collection to the place of use.
 - C. The solar energy is converted indirectly to heat through solar panels.
 - D. The solar energy is transmitted along normal wires or used to operate solar batteries

True or False: (13 points; 1 point each)

- 18. _____ Oxygen gas or ambient air can also be injected to promote growth of aerobic bacteria which accelerate natural attenuation of organic contaminants.
- 19. _____ Thermal oxidation is an approach that is somewhat controversial because of the risks of dioxins released in the atmosphere through the exhaust gases or effluent off-gas.
- 20. _____ Bioremediation is sometimes used in conjunction with a pump and treat system.
- 21. _____ Incremental health risk is the decrease risk that a receptor (normally a human being living nearby) will face from the lack of a remediation project.
- 22. _____ A set of standards used in Europe exists and is often called the England standards.
- 23. _____ Environmental remediation deals with the removal of pollution or contaminants from environmental media such as soil, groundwater, sediment, or surface water.
- 24. _____ Green taxes are taxes on each unit of pollution discharged, each unit of pesticide used, each unit of fossil fuel used, each unit of solid waste produced, each unit of virgin resource used, etc.
- 25. _____ GATT stands for General Assessment on Taxes and Trade.
- 26. _____ The extinction rate currently is around 2 species per year.
- 27. _____ Industrial wastes composes of comprises of metals, bacteria, organic solids. It comes from runoff from impermeable areas like pavements, roads, car parking etc. The flow is a reflection of the precipitation.
- 28. _____ Many physical methods of pre-treating industrial wastes are carried out after they are discharged into sewers.
- 29. _____ Perfect-looking fruits and vegetables are more likely to contain high levels of pesticide residues.
- 30. _____ The cause of any tragedy of the commons is that when individuals use a public good, they do not bear the entire cost of their actions.

31. How does the United States fund remediation? (2 points)
32. List three examples of remediation technologies. (3 points)
33. Give an example of bioremediation and how it works. (2 points; 1 point for example, 1 for explanation)