

## Human Impact on The Environment

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

Date: \_\_\_\_\_

1. Erosion resulting from loss of topsoil due to poor farming techniques may be prevented by
  - A. overgrazing pasturelands
  - B. removing trees, shrubs, and herbs
  - C. overcropping farm fields
  - D. overcropping plowed fields

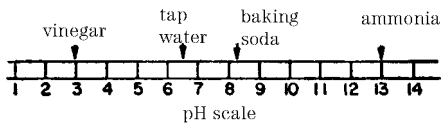
Use this information to answer the following question(s).

Acid rain is a serious environmental problem in large areas of Canada and the northeastern United States, including New York State. It is partly created as rain “washes out” sulfur and nitrogen pollutants from the air. Acid rain alters the fundamental chemistry of sensitive freshwater environments and results in the death of many freshwater species. The principal sources of this pollution have been identified as smokestack gases released by coal-burning facilities located mainly in the midwestern United States.

“Unpolluted” rain normally has a pH of 5.6. Acid rain, however, has been measured at pH values as low as 1.5, which is more than 10,000 times more acidic than normal. Commonly, acid rain has a pH range of 3 to 5, which changes the acidity level of the freshwater environment into which it falls. The effect of the acid rain depends upon the environment’s ability to neutralize it. Evidence is accumulating, however, that many environments are adversely affected by the acid rain. As a result, the living things within lakes and streams that cannot tolerate the increasing acidity gradually die off.

There are many environmental problems that result from acid rain. Most of these problems center around the food web upon which all living things, including humans, depend. If freshwater plants, animals, and protists are destroyed by the acid conditions, then terrestrial predators and scavengers dependent on these organisms for food are forced to migrate or starve. These changes in a food web can eventually affect the human level of food consumption.

2. The accompanying scale shows the pH of four common household substances. Acid rain has a pH closest to that of which of these substances?



- A. ammonia                      B. tap water  
C. baking soda                D. vinegar
3. What is most likely the source of acid rain in New York State?
- A. far western United States  
B. midwestern United States  
C. far eastern Canada  
D. far western Europe
4. Which food chain includes organisms that would most immediately be affected by acid rain?
- A. grass → rabbit → fox → decay bacteria  
B. algae → aquatic insect → trout → otter  
C. shrub → mouse → snake → hawk  
D. tree → caterpillar → bird → lynx

5. Acid rain is generally considered a negative aspect of human involvement with the ecosystem. As such, it would most correctly be classified as a type of
- A. biological control  
B. conservation of resources  
C. technological oversight  
D. land use management
6. A strain of fish that could survive under conditions of increased acidity could best be obtained by
- A. binary fission  
B. vegetative propagation  
C. selective breeding  
D. budding
7. Which illustrates the human population's increased understanding and concern for ecological interrelationships?
- A. importing organisms in order to disrupt existing ecosystems  
B. allowing the air to be polluted only by those industries that promote technology  
C. removing natural resources from the Earth at a rate equal to or greater than the needs of an increasing population  
D. developing animal game laws in order to limit the number of organisms that may be killed each year

8. Humans have been responsible for some of the negative changes that occur in nature because they
- A. have controlled the use of chemical biocides
  - B. have passed laws to preserve the environment
  - C. are able to conserve scarce resources
  - D. are able to modify their physical environment
9. A poor land use practice that usually leads to the loss of soil nutrients is
- A. reforestation
  - B. recycling
  - C. overcropping
  - D. sewage control
10. Which pollutant is produced by the burning of coal and oil and can result in the production of acid rain?
- A. phosphate
  - B. sulfur dioxide
  - C. lead
  - D. hydrogen chloride
11. If excessive amounts of hot water are discharged into a lake, the immediate result will most likely be
- A. an increase in the sewage content of the lake
  - B. a decrease in the amount of dissolved oxygen in the lake
  - C. an increase in the amount of PCB pollution in the lake
  - D. a decrease in the amount of phosphates in the lake
12. The release of the pollutant sulfur dioxide ( $\text{SO}_2$ ) into the atmosphere may seriously affect aquatic plants and animals by forming
- A. acid rain
  - B. phosphate
  - C. DDT
  - D. nuclear waste
13. Which activity helps scientists control harmful pests and also protects the environment from pollution?
- A. feeding toxic substances to organisms
  - B. feeding herbicides to organisms
  - C. using sex hormones as biological controls
  - D. using pesticides ten times a year

14. An example of a biological control against insects is the use of
- A. herbicides
  - B. wildlife refuges
  - C. pesticides
  - D. sex hormones
15. Which human activity has probably contributed most to lake acidification in the Adirondack region?
- A. passage of environmental protection laws
  - B. reforestation projects in lumbered areas
  - C. production of sulfur and nitrogen air pollutants
  - D. use of biological insect controls
16. African elephant tusks consist of high-quality ivory. In recent years, the elephant population in certain African wildlife preserves has decreased. This decrease is most likely due to
- A. air pollution
  - B. human exploitation
  - C. biocide use
  - D. importation of Japanese beetles
17. Endangered peregrine falcons have been bred in captivity and released in areas where pigeons and rodents are abundant. This activity is an example of
- A. conservation of resources and exploitation
  - B. overhunting and biological control
  - C. species preservation and use of biocides
  - D. species preservation and biological control
18. An example of a human activity that has had a positive effect on the environment is the
- A. disruption of natural habitats through urbanization
  - B. exploitation of rare South American birds
  - C. use of reforestation to control erosion
  - D. uncontrolled hunting of endangered species of animals
19. The number of chemical industries along New York state's rivers is increasing. What is the most likely consequence of this increased industrialization?
- A. a decrease in the amount of water needed by industry
  - B. a decrease in the amount of water pollution
  - C. an increase in the destruction of natural food webs
  - D. an increase in the amount of water available for recreational use

## **Decomposition of the Ozone Layer**

The Earth has long been protected from the harmful radiations of the Sun by a layer of the atmosphere known as the ozone layer. This layer absorbs ultraviolet light. Recent evidence indicates that this protective layer is starting to decompose and “holes” are being formed.

The first “hole” was observed in 1983 over Antarctica. Now there is evidence of a second “hole” over Norway. It is believed that the atmosphere has had an annual ozone loss of three percent.

Some scientists believe that the “holes” are linked to the use of certain chemicals such as chlorofluorocarbons (CFC’s). CFC’s are found in some aerosol sprays, refrigerants, and even in styrofoam. When CFC’s are exposed to sunlight, chlorine is released from the CFC’s. This chlorine acts as a catalyst in the breakdown of ozone. Other scientists believe that the “holes” are related to solar activity, changing weather patterns, and volcanic activity.

Whatever the cause, scientists agree that the potential dangers are significant. The Environmental Protection Agency (EPA) estimates that a one percent drop in global ozone could cause an additional 20,000 cases of skin cancer in the United States. Increases in ultraviolet radiation could also increase the mutation rate in plants, animals, and micro-organisms, endangering the existence of some life forms.

20. Decomposition of the ozone may lead to an increase in mutations because
- A. plants can only utilize visible light for photosynthesis
  - B. it allows more ultraviolet rays to penetrate the atmosphere
  - C. changing weather patterns act as selecting agents
  - D. more free oxygen will be available, causing a decrease in carbon dioxide

21. Based on the reading passage, which statement can be made about the decomposition of the ozone layer?
- A. The decomposition is due to very reactive oxygen.
  - B. The decomposition rate is increasing three percent every ten years.
  - C. "Holes" in the ozone layer are caused by ozone decomposition.
  - D. All scientists agree on the cause of the decomposition of the ozone layer.

22. The ecological survival of many plants and animals has been aided most by the
- A. raising of industrial smoke stacks to spread sulfur dioxide away from the immediate vicinity of the combustion
  - B. reduction in the number of pollution control laws
  - C. heavy use of insecticides to kill all insect pests that compete with humans for food sources
  - D. development of research aimed toward the preservation of endangered species

23. Which human activity has been banned in most areas because of its negative impact on the biosphere?
- A. reforestation and covercropping
  - B. use of DDT to control insects
  - C. biological control of pests
  - D. management of wildlife

24. The lower part of the Hudson River contains large amounts of polychlorinated biphenyls (PCB's) and heavy metals. Which statement best explains their presence in the river?
- A. They are introduced by environmentalists to kill sewage bacteria.
  - B. They are the decomposition products of river organisms.
  - C. They were accidentally spilled into the river by fishermen.
  - D. They were discharged into the river as manufacturing by-products.
25. When farmers rotate their crops, leguminous plants primarily serve to
- A. prevent erosion
  - B. enrich the soil with nitrates
  - C. add oxygen to the soil
  - D. help pollination
26. Some negative effects of human activities of the environment can be counteracted by increasing the
- A. growth of the human population
  - B. use of pesticides
  - C. enforcement of pollution control laws
  - D. use of nonbiodegradable materials
27. Japanese beetles and gypsy moths were accidentally introduced into North America. The most probable reasons these insects have become serious pests in North America is that they
- A. were bred by research scientists and are resistant to all pesticides
  - B. are protected by environmental laws and feed on other insects species
  - C. have few natural enemies and reproduce successfully
  - D. are affected by biological controls and feed on plants
28. The peregrine falcon has been bred in captivity and then released into areas where there is an ample food supply. This procedure best illustrates
- A. species preservation
  - B. biological control
  - C. biocide use
  - D. species exploitation
29. Which activity has had the most negative effect on the environment?
- A. recycling of aluminum cans
  - B. biological control of insect pests
  - C. importation of the gypsy moth
  - D. control of air pollution



30. Which activities most directly control erosion?
- A. use of reforestation and covercropping
  - B. establishment of game laws and fisheries
  - C. use of phosphates and hydrocarbons
  - D. establishment of wildlife refuges and national parks

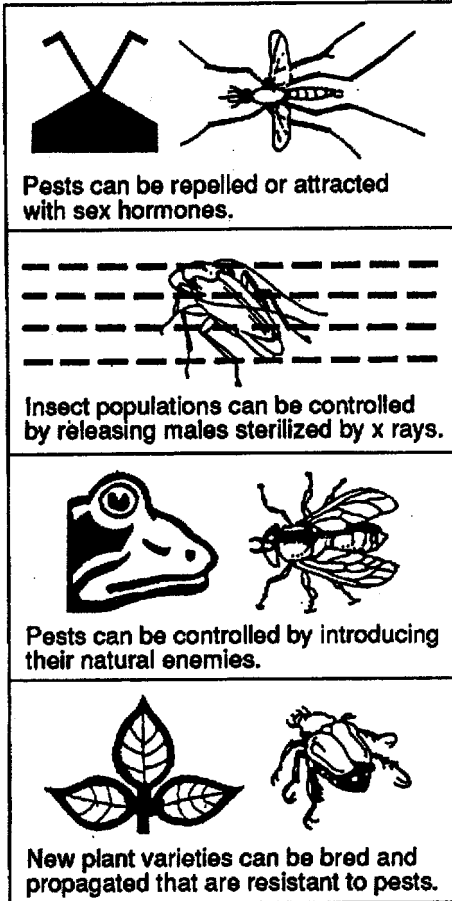
31. After the Industrial Revolution, dark-colored moths outnumbered light-colored moths in certain regions of England. Within the past 40 years, factories in these regions have added scrubbers and air purifiers to their smokestacks, and the relative number of light-colored moths has increased. The probable reason for this increase is that
- A. the allele for light color became dominant over the allele for dark color
  - B. the environment favored the survival of light-colored moths over dark-colored moths
  - C. dark-colored moths turned light because they needed to survive
  - D. overpopulation occurred and most of the light-colored moths died, leaving only dark-colored moths to reproduce

32. Which method of combating insect pests is *least* likely to affect other animal species, disrupt food webs, and contaminate the land?
- A. using biological controls
  - B. employing fluid biocides
  - C. using powdered pesticides
  - D. draining wetlands

33. Some animal and plant species are in danger of becoming extinct because of
- A. an increase in human population controls
  - B. the exploitation of these species for their products
  - C. the rapid reproduction of these species
  - D. an increase in available food supplies

34. Affluent lifestyles have led to increased demands for a wide variety of consumable products. The packaging of these products has caused environmental problems that are most directly associated with
- A. food web contamination
  - B. urbanization
  - C. PCB pollution
  - D. solid waste disposal

35. The chart shown illustrates some methods of pest control. Pests can be repelled or attracted with sex hormones. Pests can be controlled by introducing their natural enemies. New plant varieties can be bred and propagated that are resistant to pests. One likely effect of using these methods of pest control will be to



- A. prevent the extinction of endangered species
- B. increase water pollution
- C. reduce pesticide contamination of the environment
- D. harm the atmosphere

36. Which statement is a valid reference that can be made from the cartoon shown?



Suddenly, Fish and Wildlife agents burst in on Mark Trail's poaching operation.

- A. Wildlife agents regulate reproduction rates of animal species in wildlife refuges.
- B. Wildlife agents prevent the importation of organisms to areas where they have no natural enemies.
- C. Some human activities have led to the endangerment of numerous animal species.
- D. Biological control of pest species is prevented by laws.

## **Oil Leaks Offshore Don't Always Mean Pollution**

People have long criticized oil companies for the accidental release of oil into the sea because of its negative impact on marine life. However, over the past decade, a strange new twist has developed. Some scientists have begun to wonder whether drilling in the Gulf of Mexico could threaten marine life by—oddly enough—reducing oil leaks.

Work has recently focused on many natural oil seeps on the Gulf floor. Researchers have discovered a variety of organisms associated with the seeps, including fields of huge tubeworms, giant mussels and deep-sea crabs. These petroleum-seep communities are isolated from sunlight. Life there must rely on a food chain that begins with energy from the constant petrochemical bath of the seeps. For example, bacteria living in the gills of the giant mussels metabolize methane from the seeps and provide food for their hosts.

Soon after their discovery, protection of seep dwellers became a priority. Initially researchers thought that these organisms were so rare that they should be classified as endangered species. As a result, the Minerals Management Service issued special guidelines for work that might affect chemosynthetic organisms.

Continuing study revealed that seep organisms are not rare after all. Communities dependent on chemosynthesis seem to develop wherever substantial leads occur on the deep-sea floor. There is little fear now that offshore drilling could accidentally destroy some unique species, although offshore extraction of petroleum could possibly reduce pressure to nearby seeps and rob these deep-sea species of their basic food materials.

Texas oil drillers often found that the extraction of oil on land caused nearby seeps to dry up. Similar results could happen offshore. The loss of a seep by exploiting its source is indeed possible. However, evidence shows that certain offshore drilling operations have not affected nearby petroleum-seep communities. For the time being, the giant mussels and giant tubeworms, as well as the giant oil corporations, appear to be able to continue to feed together happily in the Gulf.

37. Why does offshore drilling present a possible threat to petroleum-seep communities?
- A. Offshore oil drilling results in an increased number of oil seeps.
  - B. Removal of offshore petroleum may reduce pressure to oil seeps, causing them to dry up.
  - C. Offshore oil drilling introduces new species into the petroleum-seep communities.
  - D. Removal of offshore petroleum causes overpopulation problems within the petroleum-seep communities.

38. Shortly after the petroleum-seep communities were discovered, researchers became concerned that the petroleum-seep dwellers might
- A. decrease the world oil supply
  - B. multiply and affect other ocean dwellers
  - C. pollute the sea
  - D. be endangered species

39. In the Coachella Valley in California, much of the desert has been converted into golf courses, housing developments, and hotels. The habitat of the Coachella Valley fringe-toed lizard is rapidly being lost. This lizard is adapted for life on fine, windblown sand. Environmentalists want to save the lizard, and developers want to continue construction. Which solution would be of most benefit to all involved?
- A. Land in the Coachella Valley should be purchased and set aside as a preserve for the lizards.
  - B. The fringe-toed lizards should be crossed with a species adapted for survival in a different habitat.
  - C. The land should be developed as planned and the lizards relocated to another valley.
  - D. The land should be developed as planned and the lizards monitored to see if they can adapt to the new conditions.

40. The use of ladybugs and praying mantises to consume insect pests in gardens is an example of
- A. biological control of insect pests
  - B. exploitation of insect pests
  - C. abiotic control of insect pests
  - D. use of biocides to control insect pests

41. The creation of wildlife refuges and the enforcement of game laws are conservation measures that promote increased

- A. use of biocides
- B. preservation of species
- C. use of biological controls
- D. exploitation of species

42. One practice that has successfully increased the number of bald eagles in the United States is the

- A. protection of their natural habitat
- B. importation of food to their nesting sites
- C. preservation of other eagle species that occupy the same niche
- D. increased use of pesticides

43. In order to preserve the biosphere for future generations, humans must

- A. make use of technology to develop new herbicides
- B. put all wild animals in game preserves
- C. explore ways to drain and fill wetlands along the seacoast
- D. understand how living things interact with their environment

44. Humans often have not given much thought to the long-term impacts of technological change. As the 20th century comes to a close, most scientists would agree that humans should

- A. use knowledge of ecology to consider the needs of future generations of humans and other species
- B. use new technology to expand human influence on all natural communities
- C. learn how to control every aspect of the environment so that damage due to technology will be spread evenly
- D. develop the uninhabited parts of Earth for the human population increase

45. An activity that would help to ensure a suitable environment for future generations is the increased use of

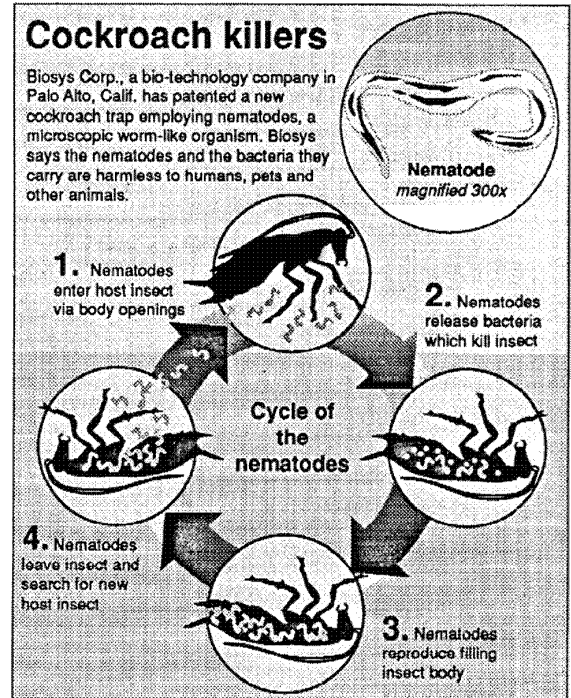
- A. fossil fuels
- B. pesticides
- C. biological controls
- D. chemical dumps

46. Many people place bat boxes on their property to provide housing that attracts insect-eating bats. This activity has a positive effect on the environment because it represents an increased use of

- A. saprophytic relationships
- B. biocides
- C. biological controls
- D. herbicides

47. Which human activity would be more likely to have a negative impact on the environment than the other three?
- using reforestation and cover cropping to control soil erosion
  - using insecticides to kill insects that compete with humans for food
  - developing research aimed toward the preservation of endangered species
  - investigating the use of biological controls for

48. The diagram below shows how an insect trap is used to kill cockroaches.



This insect trap is an example of

- exploitation of organisms
  - biological control
  - herbicide use
  - competition between species
49. According to the heterotroph hypothesis, which gas was *lacking* in the atmosphere of primitive Earth?
- ammonia
  - hydrogen
  - methane
  - oxygen

50. A wetland was drained to build a mall. Two years later, there were no more toads in that area. Why did the toads disappear?

- A. The toads were destroyed by the construction equipment.
- B. The toads died because toads cannot breathe out of water.
- C. The toads were frightened and went into the woods.
- D. The toads got their food from the wetland ecosystem.

51. How does too much fishing in an area affect its ecosystem?

- A. The fish will lay many more eggs to replace the fish that were caught.
- B. Organisms that eat the fish could become endangered due to starvation.
- C. Organisms that the fish eat will become endangered.
- D. People could eat too many fish and become ill.

52. American alligators used to be an endangered species, but they are not endangered anymore. Which of the following is the *best* reason why there are more American alligators in Louisiana today than there were 50 years ago?

- A. American alligators have learned to live in new places.
- B. American alligators are bigger now than they were 50 years ago.
- C. American alligators are now protected from hunting by humans.
- D. American alligators have much more habitat than they did 50 years ago.

53. Some species of penguins, such as chinstrap penguins, depend on open water for their survival. Other species of penguins, such as Adelie penguins, depend on ice. Over the last 20 years, the population size of chinstrap penguins has increased, and the population size of Adelie penguins has decreased.

Which of the following *most likely* caused these changes in population size?

- A. an increase in landmass and shorelines
- B. an increase in global air and water temperatures
- C. a decrease in the number of leopard seal predators
- D. a decrease in the length of time before chicks take to sea



54. Which of the following *best* explains why tropical insects may be at greater risk for extinction from global warming than insects from higher latitudes?
- A. Many tropical insects lay eggs year-round.
  - B. Tropical insects include more pollinator species.
  - C. Many tropical insects are herbivores rather than carnivores.
  - D. Tropical insects have narrower ranges of tolerance for temperature changes.

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- |         |   |         |   |
|---------|---|---------|---|
| 1.      |   | 21.     |   |
| Answer: | D | Answer: | C |
| 2.      |   | 22.     |   |
| Answer: | D | Answer: | D |
| 3.      |   | 23.     |   |
| Answer: | B | Answer: | B |
| 4.      |   | 24.     |   |
| Answer: | B | Answer: | D |
| 5.      |   | 25.     |   |
| Answer: | C | Answer: | B |
| 6.      |   | 26.     |   |
| Answer: | C | Answer: | C |
| 7.      |   | 27.     |   |
| Answer: | D | Answer: | C |
| 8.      |   | 28.     |   |
| Answer: | D | Answer: | A |
| 9.      |   | 29.     |   |
| Answer: | C | Answer: | C |
| 10.     |   | 30.     |   |
| Answer: | B | Answer: | A |
| 11.     |   | 31.     |   |
| Answer: | B | Answer: | B |
| 12.     |   | 32.     |   |
| Answer: | A | Answer: | A |
| 13.     |   | 33.     |   |
| Answer: | C | Answer: | B |
| 14.     |   | 34.     |   |
| Answer: | D | Answer: | D |
| 15.     |   | 35.     |   |
| Answer: | C | Answer: | C |
| 16.     |   | 36.     |   |
| Answer: | B | Answer: | C |
| 17.     |   | 37.     |   |
| Answer: | D | Answer: | B |
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| 19.     |   | 39.     |   |
| Answer: | C | Answer: | A |
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| Answer: | B | Answer: | A |

41.  
Answer: B

42.  
Answer: A

43.  
Answer: D

44.  
Answer: A

45.  
Answer: C

46.  
Answer: C

47.  
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48.  
Answer: B

49.  
Answer: D

50.  
Answer: D

51.  
Answer: B

52.  
Answer: C

53.  
Answer: B

54.  
Answer: D