

**ENVIRONMENTAL SCIENCE**  
**BSC 1050**

**Part III** Objectives (For each topic, the major problems and causes should be identified, the effects on all living organisms, from plants to man, should be shown, and solutions given to aid in solving the problem.)

Agriculture and Land Use (Chapter 7)

1. Explain why modern monoculture farms are more ecologically harmful than the smaller farms of many years ago.
2. Tell why aquaculture is a solution to some food problems but also why it is ecologically damaging.
3. Tell why irrigation is a temporary solution to some farm productivity but can be a long-term problem.
4. Show how the pyramid of numbers is related to a food chain and why starving people eat plants, not meat and identify the food group that provides man with 80% of his calories.
5. Tell how a deficiency of protein can produce kwashiorkor and brain damage in young children.
6. Give the primary reason why the clearing of jungles for farming is not a good practice.
7. Give some examples of how genetic engineering has produced more productive plants and animals.
8. Give some ways that farm land can be made more productive.
9. Explain what is meant by the "planting of introduced species often spells disaster".
10. Tell why estuaries should be preserved in relation to the food topic.
11. Give the pros and cons to using food additives.

## Biocides (Chapter 7)

12. Tell why the term "biocide" is a more accurate term than a "pesticide".
13. Name the 3 categories of insect poisons and give two examples of each.
14. Tell the difference between a water soluble and a fat soluble poison.
15. Tell why man uses 2,4,5-T and give the dangerous poison sometimes found in it as a contaminant.
16. Define and give the cause of an insect bloom.
17. Explain "biological magnification" using DDT and bird eggs as an example.
18. Tell what is meant by a biodegradable poison.
19. Give several reasons why many insects are called pests.
20. Explain how each of the following may control insect pests:
  - sterilization (screwworm in Florida)
  - use of pheromones (sex attractants)
  - use of juvenile hormones
  - elimination of the alternate host (wheat rust)
21. Compare chemical and biological insect controls.
22. Give some examples of beneficial insects.
23. Give the status of DDT use in the USA today.
24. Explain how insects become resistant to poisons so quickly.
25. Tell how a systemic poison (like temik) works in the elimination of insect pests.
26. Give an example of using a companion or resistant plant among food crops.

## Air Pollution (Chapter 9)

27. Explain the cause, effect, and give a solution for each of the following:
  - acid rain (pH less than 7)
  - greenhouse effect
  - temperature inversion
  - ozone destruction
  - photo chemical smog
  - fluorosis
  - radon gas in homes

28. Give the percentages of gases in pure air.
29. Tell what is meant by "air pollution".
30. Name the gases of each of the following symbols and tell how they are produced:  
CO<sub>2</sub>  
CO (Also identify "particulate matter" and tell how  
SO<sub>2</sub> scrubbers, filters, and electrostatic precipitators  
O<sub>3</sub> can remove them.)  
O<sub>2</sub>  
NO<sub>2</sub>
31. Explain why various forms of transportation cause much of the air pollution today.
32. Explain the effect of smoking on lung alveoli.
33. Tell how "synergism" relates to photochemical smog.
34. Tell how various air pollutants may damage plants.
35. Give some good solutions to the overall air pollution problem today.

Water Pollution and Thermal Pollution (Chapter 10)

36. Tell why water is a compound while air is a mixture.
37. Explain the relationship between BOD and dissolved oxygen.
38. Give the relationship between dissolved oxygen and water temperature.
39. Give a very common cause of fish kills.
40. Explain how each of the following may be used:  
Eckman dredge (and index organisms)  
Secchi disc (turbidity)  
desalination plant (Florida)  
trickling filter
41. Tell the purpose of a coliform count.

42. Explain what occurs in each of the three stages of sewage treatment (Primary-Secondary-Tertiary). Tell when a "trickling filter" would be used.
43. Explain the difference between a limnologist and an oceanographer.
44. Describe an oligotrophic and a eutrophic lake.
45. Give some causes of rapid eutrophication.
46. Explain why the oceans of the world produce more oxygen than land masses.
47. Give the relationship between lake turbidity and photosynthetic activity in the water.
48. Explain how washing your clothes may cause more rapid eutrophication of a lake.
49. Tell what happens to the oil several months after an oil spill.
50. Give the cause, effects, and suggest solutions for "thermal pollution".
51. Tell the difference between "point" and "non-point" pollution.
52. Suggest some good solutions to our overall water pollution problems today.

### Solid Wastes (Chapter 13)

53. Name and evaluate several methods of disposing of solid wastes.
54. Describe a "sanitary landfill" and name some problems caused by this method.
55. Tell why a biodegradable product may not biodegrade when buried in a landfill.
56. Discuss these six methods of recycling waste materials:
  - melting
  - revulcanization
  - pulping
  - composting
  - rendering
  - fermentation