

Environmental Geology

Test 1

Fall, 2005

If any of the following questions are unclear, please ask me about them. Use the space provided. Upon completion of your test, please sign the following statement:

I have neither given nor received help on this test. I have referred to no resources except for the outline that I was allowed to bring to class.

Signature: _____

Name: _____

1. **(5 pts)** What is the definition of risk? How has the increase in human population affected risk from natural hazards? Give your answer in terms of both parts of our definition of risk.

2. **(5 pts)** Parts of Dubuque are vulnerable to flooding from the Mississippi River. Explain the difference between a statistical approach and a physical-system approach to determining the risk of flooding. In each case, name one factor you would consider and one type of data you would gather. What is the most important factor that makes you concerned about the use of the statistical approach?

3. **(2 pts)** Why was much of the Trans-Alaska Pipeline constructed above ground?

4. **(2 pts)** A developer wants to create a new subdivision in an western Dubuque. An Environmental Impact Statement is required because of its size and location on the headwaters of a branch of Catfish Creek. What are two features the EIS should include?
- 1.
 - 2.
5. **(2 pts)** What are two sources of non-point pollution that affect Iowa streams?
- 1.
 - 2.
6. **(4 pts)** Dubuque gets its drinking water from limestone aquifers, which causes the water to be hard (high alkalinity.) Some people hypothesize that this may lead to increased heart and circulatory problems. How would you design a study to test this hypothesis?
7. **(8 pts)** Draw a sketch of a septic tank. What are two requirements for the successful utilization of the system? What is the difference between aerobic and anerobic bacteria? Where do each occur in the system?
8. **(2 pts)** What are two hazards that are natural but made worse by human modifications of the environment?

_____and_____

9. (4 pts) In the study of hazardous waste and birth defects that we discussed in class, briefly describe the study, then give three reasons for studying birth defects potentially resulting from exposure to hazardous waste.

Reason 1.

Reason 2.

Reason 3.

10. (4 pts) Sketch and label a leaking underground storage tank.

11. (2 pts) The mining of which two metals led to Julien Dubuque's coming to this area?

_____and _____

The following questions are worth 1 point each

12. _____(T/F) Mercury is an organic chemical.
13. _____(T/F) Cancer death rates are higher in South Louisiana than the average in the U.S.A.
14. _____(T/F) Ducktown, TN, was originally the site of of a copper mine.
15. _____(T/F) The worst natural disaster in U.S. history in terms of loss of human life was the 1900 hurricane that hit Galveston Island.
16. _____(T/F) Hurricanes, of all natural hazards, kill the most people in the U.S. in an average year.
17. _____(T/F) The ratio of the rate of death from lung cancer among smokers to death from lung cancer among non-smokers is approximately 2 to 1.
18. The increase in concentration of pollutants in the tissues of species higher up the food chain is called

_____.

19. The use of bacteria to decompose contamination into less hazardous substances is called

20. The source of acid from acid-mine drainage is primarily _____

21. Give an example of a pathogenic microorganism. _____

The following questions are based on the readings from the book.

22. (3 pts) Explain briefly the environmental problems of the Aral Sea.

23. (2 pts) Which two countries have the world's highest population?

_____ and _____

24. (3 pts) What is sustainability as it is applied to the environment?

25. (3 pts) Radon gas is a concern to anyone purchasing a home in Dubuque. What is radon gas? How is it a health hazard? How can the risk be reduced?

26. (3 pts) What is BOD? Why does it matter?

27. (3 pts) What is eutrophication?

28. (3 pts) What is salt-water intrusion?

29. (3 pts) What is the difference between solid waste and hazardous waste? Which kind does the Dubuque landfill on Highway 20 accept?

30. (3 pts) What is asbestos? Explain the controversy about its health effects.

31. (4 pts) Name two examples of air pollutants and their *effects*.

1.

2.

Essay (20 pts, including 4 for your outline): In the space below and on the back of the paper, answer the following question: *What should be the distinction between moral, technical, and financial responsibility as applies to the hazardous waste site at Love Canal?*

Attach your outline at the end of the test. You may use the back of this page.