

2008 Wisconsin Envirothon **KEY**

Water Resources Exam

Answers that are correct but differ strongly from answer key must be initialized by Station Captain as an approved answer prior to delivery to score stewards.

For the following characteristics select which type of lake is best described (1pt each)(10 pts total):

A. Oligotrophic Lake or B. Eutrophic Lake

- | | |
|--|--|
| 1. <u> A </u> High transparency | 6. <u> B </u> Non-game fish |
| 2. <u> B </u> Low transparency | 7. <u> B </u> Abundant plant life |
| 3. <u> A </u> Rooted vegetation scarce | 8. <u> A </u> Game fish |
| 4. <u> B </u> Rooted vegetation abundant | 9. <u> A </u> Relatively infertile |
| 5. <u> B </u> Algae blooms and small fish kills common | 10. <u> B </u> Nutrient Rich Sediments |

Fill in the blank

11. What is the largest inland lake in Wisconsin? (2 pts) Winnebago
12. List 2 of the sources of nutrients that lead to increased eutrophication in lakes. (2 pts each, 4 pts total)
Agricultural runoff, Nutrients in urban runoff
13. Most lake flora in Wisconsin is limited by what nutrient? (2pts) Phosphorus
14. Name 2 things that recreational water users can do to prevent the spread of exotic species. (4pts)
Wash boat, dump minnows, don't transport fish, learn to recognize them

Identify each of these as a positive (P) or negative (N) effect on the stream habitat. (2pts each, 8 pts total)

15. N Steam Straightening
16. P Bank Undercutting
17. P Boulder placement
18. P Placing Brush bundles

___/30

Running Total: 30

19. As a lake becomes more eutrophic, recreation typically decreases. List 2 reasons why (4 pts)

Nuisance Algae growth (green stinky water)

Nuisance aquatic plant growth (hard for boaters)

20. List 3 of the negative impacts recreational boaters have on lakes (6 pts):

Answers will vary, and may differ from what is included below. Station Captain will initial other correct answers.

Gas motors leave petroleum residue on the water

power loading at launch causes scour hole and disturbed habitat for invasive species

lead from fishing jigs and sinkers can cause mortality in waterfowl that may ingest it

docks and piers shade out native plants in the littoral zone leaving areas with no habitat

shoreline disturbances like riprap and seawalls prevent amphibians from coming ashore

increased wave action leads to shoreline erosion

True/False and Multiple Choice (2 pts each) (12 pts total)

21. Most impoundments were constructed primarily to create recreational opportunities. T or F

22. Most non-native species are introduced to inland waters via recreational boat users. T or F

23. Rice and cranberries will grow only in wetlands. T or F

24. Lakes in the early stages of eutrophication provide excellent fishing. T or F

25. Which of the following fish species would you not find in a eutrophic lake:

a. northern pike

b. bowfin

c. brown trout

d. black crappie

e. yellow bullhead

26. Groundwater can be polluted by

a. road salt

b. lawn fertilizer

c. motor oil

d. gas from leaky storage tanks

e. all of the above

____/22

Running Total: 52

27. The most common water quality parameters tested for in lake water are: (2 pts)
- a. pH, nutrients, metals, plant material, dissolved oxygen, total suspended solids and fish species
 - b. temperature, dissolved oxygen, pH, Secchi disk depth, nutrients, total suspected solids and turbidity
 - c. boat traffic, pH, temperature, turbidity, plant life, bacteria, depth
 - d. depth, recreational value, total suspended solids, pH, temperature, plant life, animal life
28. Lake Mead, AZ was recently in the news following a report that it may dry up by 2021 mainly due to which of the following factors: (2 pts)
- A. climate change and strong demand for water
 - B. seepage into surrounding lakes and rivers
 - C. shifting of plates under the earth's surface
 - D. federal policy requiring more water to be released into the Grand Canyon
 - E. All of the above
29. It's July in Wisconsin and you get a Dissolved Oxygen reading of 14.6 mg/L out of a stream at 1:30 in the afternoon. Filamentous algae is abundant. What would you expect the Dissolved Oxygen to be at 1:30 in the morning? (2 pts)
- a. Approximately the same (14.6 mg/L)
 - b. Greater than 14.6 mg/L
 - c. Around 10 mg/L
 - d. around 5 mg/L or less

Short Answer

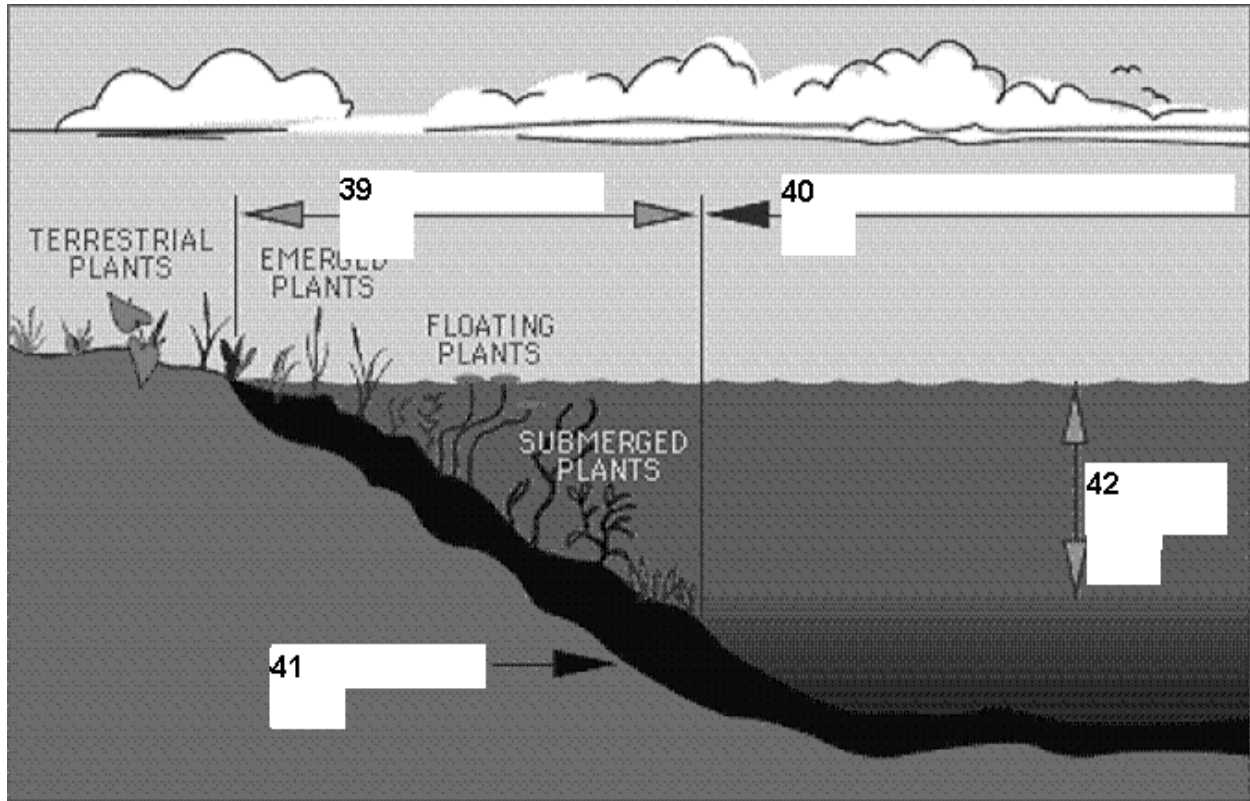
30. Explain your answer to question 29: (5 pts)

During the day, algae and phytoplankton are photosynthesizing at their peak and pumping oxygen into the water. At night photosynthetic activity ceases and respiration kicks in removing oxygen from the water column. The daytime reading of 14.6 is a supersaturated condition reflecting an overabundance of nutrients and primary production. At night it would be normal for the Oxygen level to fall to 2 or 3 mg/L.

Matching- match the word to its definition -- Not all words/letters may be used (2pts each)

31. I Sustained flow of a stream in the absence of direct runoff. A. Fen
32. K The depth at which the temperature gradient is steepest during the summer. B. Thalweg
33. D The amount of solid particles that are suspended in water and that cause light rays shining through the water to scatter. C. Yield
34. B The line defining the deepest points along the length of a river bed. D. Turbidity
35. G The place where a sewer, drain, or stream discharges to a receiving water body. E. Bog
36. A Peat-accumulating wetland that generally receives water from surface runoff and (or) seepage from mineral soils in addition to direct precipitation; generally alkaline; or slightly acid. F. Peak Flow
37. F The maximum instantaneous discharge of a stream or river at a given location. G. Outfall
38. H The material in transport that primarily is supported by the streambed. H. Bedload
- I. Base Flow
- J. Percolation
- K. Thermocline
- L. Porosity

Label the different biological lake zones (2 pts each) (8 pts total).

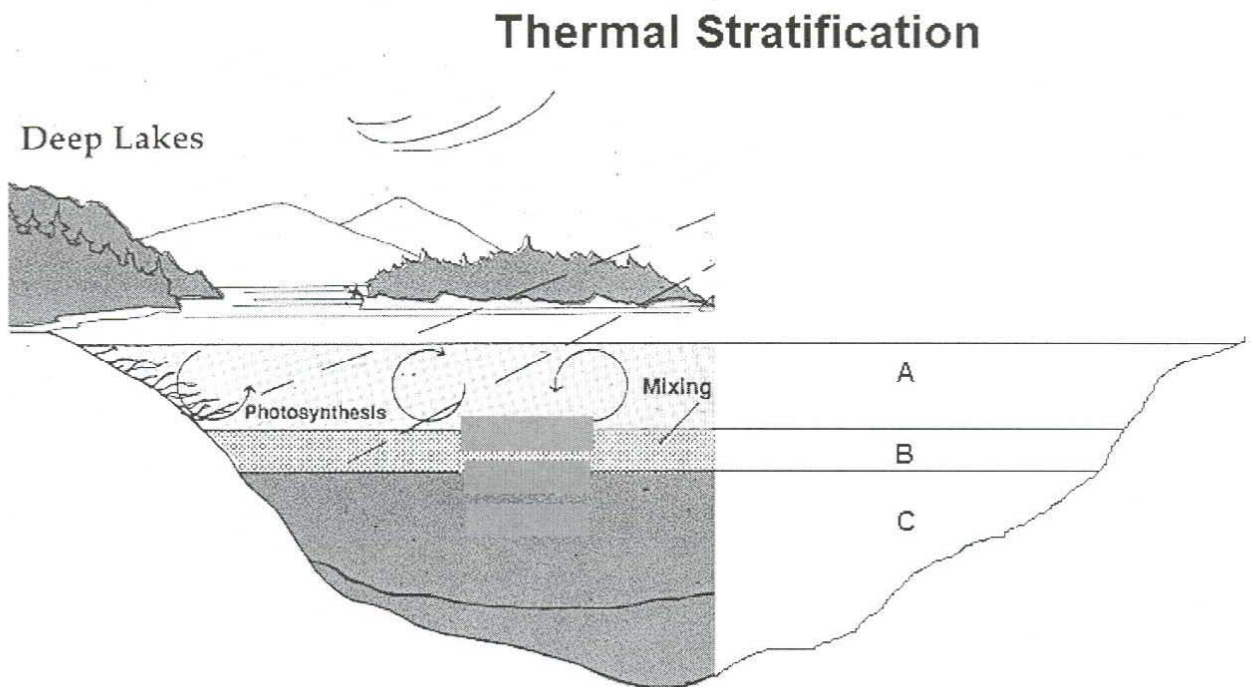


39. Littoral zone Hint- zone where sunlight penetrates all the way to the sediment and allows aquatic plants to grow.
40. Limnetic zone/Open Water/pelagic Hint- open water area where light does not generally penetrate all the way to the bottom.
41. Benthic zone/profundal zone/aphotic zone Hint- The bottom sediment which has a surface layer abundant with organisms. Most of the organism are invertebrates, such as Dipteran insect larvae.
42. Euphotic zone/limnetic zone/photoc zone Hint- Light levels become too low for photosynthesizers at the deepest extent.

___/8

Running Total: 87

Label the different thermal stratification zones (1pt each- Not all words may be used)



43. Epilimnion Zone A

44. Metalimnion (Thermocline) Zone B

45. Hypolimnion Zone C

Mezolimnion, Altolimnion, Hypolimnion, Compolimnion, Epilimnion, Stratelimnion, Metalimnion

Exotic Species Identification

2 Pts Each (10 Points Total)

46. Rusty Crayfish

47. Eurasian Watermilfoil

48. Zebra Mussel

49. Goby/Ruffe

50. Purple Loosetrife

TIE BREAKER

List Arizona's 4 Major Rivers and 6 Major Lakes

Colorado River

Little Colorado River

Gila River

Bill Williams River

Lake Mead

Lake Havasu

Lake Mohave

Theodore Roosevelt Lake

San Carlos Lake

Lake Powell

Running Total: 100