Aquatics Ecostation Test

Area 3 Envirothon – Jefferson Sportsman Club, Jefferson County

April 26, 2017

1. Limnologists estimate this depth to be the point at which the amount of light available is reduced to 0.5% - 1% of the amount of light available at the lake surface.

   A. density stratification
   B. saturation
   C. euphotic zone
   D. thermocline

2. The layer of the water column in which the temperature declines rapidly with depth is called the:

   A. epilimnion
   B. saturation layer
   C. hypolimnion
   D. metalimnion

3. The upper layer of the water column where the water is warm and typically well mixed is called the:

   A. epilimnion
   B. thermocline
   C. hypolimnion
   D. metalimnion

4. Organisms that live in aquatic systems experience limited temperature fluctuations due to water's:

   A. high specific heat
   B. high viscosity
   C. high surface tension
   D. covalent nature

5. You may notice mayfly larvae trying to emerge from a stream being slowed down when they reach the surface. Why might this be?

   A. because of the surface tension of the water
   B. because of the colder temperature at the surface
   C. because of less oxygen at the surface
   D. because of higher flows at the surface

6. The streamlined body shape of many aquatic organisms that swim helps reduce frictional resistance caused by water's high:

A. buoyancy
B. viscosity
C. surface tension
D. density

7. Water bodies that have two mixing periods are referred to as:

A. polymictic
B. dimictic
C. temperate water bodies
D. meromictic

8. Which of the different types of freshwater algae pose the greatest risks for animals and humans?

A. green algae
B. red algae
C. blue-green algae
D. brown and gold algae

9. Toxicity from cyanotoxins present in algae have harmful effects on animals and humans. One of these toxins, known as Dermatoxin:

A. disrupts proteins that keep the liver functioning
B. causes rapid paralysis of skeletal and respiratory muscles
C. produces rashes and other skin reactions
D. none of the above

10. Aquatic organisms generally require less structural support (e.g. skeletons) due to water's high:

A. specific heat
B. buoyancy
C. surface tension
D. density

11. You are monitoring a section of creek that has recently been logged. What would you predict about the change in the average water temperature in that section?

A. it would evaporate completely
B. it would stay the same
C. it would decrease
D. it would increase

12. Why are autumn and spring temperatures colder in deeper areas of lakes than they are in winter?

A. air temperatures are colder in autumn and spring
B. there is a lag time for the cold water to reach these depths
C. aquatic animals are more active in the winter
D. lake stratification causes colder water to sink in the spring and autumn

13. Algal blooms have become a problem in the last few years. Toxins from algae have been found in large lakes, rivers, small lakes and ponds, and reservoirs. Which of the following is a toxin associated with harmful algal blooms?

A. spirogyra
B. anabena
C. volvox
D. microsystin

14. VSHA, viral hemorrhagic septicemia virus, infects numerous species of marine and freshwater fish. It was noted by Cornell researchers that in 2010 the virus had reached Lake Ontario and has now spread though the Great Lakes System. The virus is not very tolerant of warm water environments. It has been further discovered that the virus has now moved into smaller lakes inland. What action below is causing the virus to spread most quickly?

A. large vessels carrying ballast water
B. movement of live, infected baitfish from one waterbody to another
C. moving sport fishing boats from one lake to another
D. none of the above

15. This plant was introduced to North America from Eurasia as an ornamental shrub for fence row and wildlife habitat. The management process was based on the hardiness and ability of the plant to thrive in a variety of soil and light conditions. However, this plant invades wetlands, swamps, bogs, fens and wet meadows, and occurs in upland habitats such as open woods, woodland edges, and old fields. This species forms dense, even-aged thickets, crowding and shading out native shrubs and herbs, often completely displacing them. It is easily confused with our native species of this plant.

A. glossy buckthorn
B. bush honeysuckle
C. Japanese knotweed
D. wild grape

16. In a stream that flows over limestone you would predict there would be higher:

A. solute concentrations
B. temperatures
C. flows
D. pool occurrences

17. All of these animals may leave tracks in the littoral area of the lake, **EXCEPT**:

A. ducks
B. raccoons
C. bluegill
D. deer

18. A principle health hazard of a lake fed by runoff from cattle pastures is:

A. Trichinella
B. Fecal coliform
C. Botulinium
D. Elysium

19. A typical lake has distinct zones of biological communities linked to the physical structure of the lake. The littoral zone is:

A. the layer from the surface down to the depth where light levels become too low for photosynthesizers
B. the sunlit euphotic zone
C. the area associated with the lake bottom
D. the area near shore where sunlight penetrates all the way to the sediment and allows aquatic plants to grow

20. The anoxic zone would be represented by the following description:

A. area where photosynthesis occurs
B. area where there is an abundance of oxygen
C. area where nitrogen and phosphorus are too high
D. area where oxygen may be the limiting factor

21. At this time of year, the surface and benthic water layers:

A. do not mix
B. mix from surficial to deep
C. are mixed by hibernating turtles
D. mix from deep to surficial

22. During a rain event, the turbidity of THIS lake would be:

A. elevated
B. reduced
C. unchanged
D. unable to be measured

23. Excessive algae and cattails in a lake or wetland suggests elevated levels of:

A. oxygen
B. hydrogen
C. halogen
D. nitrogen

24. NRCS often works with landowners who own livestock to develop Grazing Management Plans (GMPs). GMPs help landowners with livestock protect surface water by incorporating planning measures that limit livestock access to streams. This helps prevent contamination of surface water from which of the following:

A. Phosphorus, nitrogen and Escherichia coli
B. Calcium, hydrogen and listeria
C. Zinc, sodium and botrytis
D. Iron, magnesium and streptococci

25. Nutrient enrichment is the result of excess nutrients that enter the watercourse by way of animal manure, fertilizer runoff, failing septic tanks, etc. These excess nutrients cause algae to flourish. As the algae grows and then dies, the decomposition process uses up vital oxygen that aquatic organisms need to survive, resulting in short and long term harm to the ecosystem.

To minimize the risk of valuable nutrients such as nitrogen, phosphorus and potassium leaving the farm and entering the surface water, a farmer often works with NRCS to develop a Nutrient Management Plan (NMP). A typical NMP would **NOT** include which of these:

A. routine soil tests on fields every two to three years
B. projected crops to be planted with estimated yields to determine nutrient needs
C. timing of herbicide applications
D. timing and type of nutrients to be applied

26. Which of the following aquatic insects are more indicative of a lake environment (versus a stream environment)?

A. Odonata, Trichoptera, Plecoptera
B. Odonata, Diptera, Ephemeroptera
C. Odonata, Megaloptera, Coleoptera
D. none of the above

Please use the specimens and equipment provided to answer the following questions

27. Identify the specimen sample labeled 'A':

A. Mayfly
B. Damselfly
C. Caddisfly
D. Alderfly

28. Identify the specimen sample labeled ‘B’:

A. Diving beetle
B. Dung beetle
C. Ground beetle
D. Water strider

29. Identify the specimen sample labeled ‘C’:

A. Dragonfly
B. Blackfly
C. Stonefly
D. Damselfly

30. Identify the equipment provided:

A. Light Trap, Plankton Town Net, Dip Net
B. Plankton Net, Light Trap, Kick Seine
C. Bottom Sampler, Plankton Tow Net, Kick Seine
D. Bottom Sampler, Plankton Meter, Dip Net