

## 2024 Area V Envirothon: Aquatics

1. Summer fish kills can usually be attributed to a loss of dissolved oxygen that results in total or partial death of the pond's fish population. Which one is **NOT** likely a cause of a summer fish kill?
  - A. Daytime oxygen production exceeds nighttime oxygen use.
  - B. Shallow pond
  - C. Thermal inversions
  - D. Chemical applications
2. In a pond/lake the interface zone between the land and open water is called the:
  - A. Pelagic Zone
  - B. Littoral Zone
  - C. Limnetic Zone
  - D. Benthic Zone
3. When conducting a bioassessment of aquatic macro-invertebrates in a stream, which of the following aquatic macro-invertebrate assemblages are the most sensitive to pollution:
  - A. Blood midge, aquatic worm, crayfish.
  - B. Dragonfly nymph, damselfly nymph, crane fly larvae.
  - C. Pouch snails, leeches, beetle larvae.
  - D. Dobsonfly larvae, stonefly larvae, riffle beetle.
4. Aerobic bacteria require which of the following:
  - A. Water.
  - B. Soil.
  - C. Carbon.
  - D. Oxygen.
5. The best example of a lotic habitat is:
  - A. Bog.
  - B. Pond.
  - C. Lake.
  - D. Creek.
6. Which has more potential to permanently lower the water quality of streams?
  - A. Erosion.
  - B. Urbanization.
  - C. Agriculture.
  - D. Timber harvesting.

7. The following members of the lamprey family *Petromyzontidae* are parasitic **EXCEPT**?
- A. Sea Lamprey.
  - B. Least Brook Lamprey.
  - C. Silver Lamprey.
  - D. Ohio Lamprey.
8. As part of a conservation effort in your watershed, your class has been asked to plant trees in a riparian area that is currently a hay field. The local nursery has supplied you with the following list of trees. Which tree would you **NOT** want to be part of your riparian trees to be planted?
- A. Chestnut Oak.
  - B. Sycamore.
  - C. Pin Oak.
  - D. Silver Maple.
9. Mayflies belong to which order?
- A. Plecoptera.
  - B. Ephemeroptera.
  - C. Trichoptera.
  - D. Hemiptera.
10. Lake Erie has gained international attention for Harmful Algae Blooms (HABs) affecting drinking and recreational waters. Which of the following statements is true about HABS?
- A. HABs only occur in large bodies of water, such as Lake Erie or Grand Lake St Mary
  - B. HABs are caused by low oxygen conditions, usually as a result of fish kills
  - C. The presence and severity of a HAB in surface water depends on nutrient loading from the surrounding watershed.
  - D. Boiling fresh surface water will remove the HAB toxins and make it safe to drink or cook with.
11. The junction of two rivers, streams or creeks is known as.
- A. Meander
  - B. Confluence
  - C. Contributory
  - D. Thalweg
12. Vegetation holds some rain during precipitation. This water evaporates into the atmosphere without touching the soil. This process is called:
- A. Interception.
  - B. Infiltration.
  - C. Evapotranspiration.
  - D. Percolation

13. The amount of dissolved oxygen necessary to oxidize the readily decomposable organic matter is known as:
- A. Titration.
  - B. Buffering Capacity.
  - C. Biochemical Oxygen Demand.
  - D. Ion Exchange.
14. Which aquatic plant is **NOT** an example of an invasive species in Ohio?
- A. Curly-leaf Pondweed.
  - B. Common Reed.
  - C. Narrowleaf Cattail.
  - D. Spatterdock.
15. When identifying and classifying water pollution problems, one of the tools biologists use is the Fish Index of Biological Integrity (IBI). There are several metrics that are used to determine the IBI. Which is **NOT** a metric used to determine the fish IBI?
- A. Number and identity of benthic insectivorous species.
  - B. The total suspended solids in the stream.
  - C. Proportion of with disease or anomalies.
  - D. Total Number of Fish.
16. A stream's tendency to meander in the flood plain is called sinuosity. Sinuosity of a stream is calculated by:
- A. Determining the overall distance of travel, it takes from one point to another.
  - B. Subtracting the overall gradient change from a starting point to a determined end location.
  - C. The total volume of water flow over any given period of time.
  - D. Dividing the length of the stream channel from one point to another by the straight-line distance between the same points.
17. When using fish as biological indicators to determine if a stream is a cold-water stream, which of the following species would **NOT** be an indicator of a cold-water stream?
- A. Redside Dace.
  - B. Brook Stickleback.
  - C. Rainbow Darter.
  - D. Mottled Sculpin.

18. When landowners are managing their floodplain forests along streams, rivers, wetlands, ponds and lakes it is important to leave trees (living or dead) with cavities (holes in the tree) because some birds nest in these tree cavities. All of the following are cavity nesting birds in floodplain forests **EXCEPT**.

- A. Wood Ducks.
- B. Belted Kingfisher.
- C. Prothonotary Warblers.
- D. Common Mergansers

19. Which renewable energy source involves harnessing the kinetic energy of ocean tides and currents to generate electricity

- A. Tidal energy
- B. Wave energy
- C. Ocean thermal energy conversion (OTEC)
- D. Marine biomass

20. What do scientists believe is the greatest cause of the Eastern hellbenders' population decline in Ohio?

- A. Loss of high-quality habitat
- B. Siltation of streams
- C. Scarcity of their major food source
- D. Low number of breeding females

21. Research showed that in 7 of the 11 (64%) Ohio waterways sampled, no individuals <45 cm were encountered, and together with the low relative abundance, these populations do not appear to be viable. What conclusion can be drawn by research scientists from this finding?

- A. The lack of successful recruitment of young into populations appears to be the mechanism of Eastern hellbender decline in Ohio.
- B. Loss of suitable habitat in Ohio's waterways is a major cause for their decline.
- C. Agricultural runoff is negatively affecting water quality and the hellbenders reproductive abilities and therefore their decline in numbers.
- D. B & C

22. What are conservation organizations doing to hopefully maintain viable populations of the Eastern hellbender in Ohio?

- A. Support conservation efforts in areas where viable populations of the Eastern hellbender in Ohio?
- B. Investigate the feasibility of a repatriation/augmentation program for hellbenders in Ohio's stream as well as continue to conduct mark-recapture surveys to monitor populations, collect demographic and growth data, and provide on-the-ground outreach and early detection of potential threats.
- C. A & B
- D. None of the above

23. Ohio's second largest amphibian, labeled as Model #2, reaches about 13" in length and has a brown to gray ground color. Darker spots or blotches along the body are common. What is this amphibian's scientific name?

- A. *Ambystoma tigrinum tigrinum* (Eastern Tiger Salamander)
- B. *Aneides aeneus* (Green Salamander)
- C. *Notophthalmus viridescens viridescens* (Eastern Red-spotted Newt)
- D. *Necturus maculosus maculosus* (Mudpuppy)

24. What characteristic distinguishes this large species of salamander from all others in Ohio?

- A. Only permanently aquatic salamander species in Ohio
- B. Only salamander species that breathes through its skin.
- C. Only one to retain external gills throughout its life.
- D. Only species of amphibian found in all states east of the Mississippi River.

25. Which renewable energy technology uses the temperature difference between warmer and cooler water sources to generate electricity?

- A. Ocean thermal energy conversion (OTEC)
- B. Tidal energy
- C. Wave energy
- D. Marine biomass

## Answer Key

1. A
2. B
3. D
4. D
5. D
6. B
7. B
8. A
9. B
10. C
11. B
12. A
13. C
14. D
15. B
16. D
17. C
18. B
19. A
20. B
21. A
22. C
23. D
24. C
25. A