2026 State Envirothon Aquatics Test (3 points each)

Team Name_____

Fill-in-the-blank

A. Aquifers
B. Amphibians
C. Amino acids
D. Benthic macroinvertebrates
E. Biological assessment
F. Calcium carbonate
G. Cutbank
H. Estuary
I. Freshwater mussels
J. Invasive Species
K. Iron Oxide
L. Midge larva (Chironomidae)
M. Nitrate and Nitrite-Nitrogen
N. Nonpoint source
O. Point source
P. Riffles
Q. State Hygienic Laboratory
R. Turtles
S. UNI Tallgrass Prairie Center
T. Wetlands

1. _____are sedentary, long-lived mollusks that nestle in sediments while filtering particles and oxygen from the water to feed and breathe. **I. Freshwater mussels**
2. _____are small animals, such as aquatic insects, crustaceans, leeches, and snails that live on the stream bottom. **D. Benthic macroinvertebrates**
3. The _____ , an immature life stage of aquatic fly, is the most frequently collected type of benthic macroinvertebrate. **L. Midge larva (Chironomidae)**
4. Department of Natural Resources and the _____ sample fish and benthic macroinvertebrates across the state to assess the biological integrity of Iowa's streams and rivers. **Q. State Hygienic Laboratory**
5. In naturally shaped streams, aquatic organisms find a variety of habitats, including shallow, rocky rapids that are called _____. **P. Riffles**
6. _____ are ionic compounds of nitrogen and oxygen which are common contaminants of drinking water and affect the health of lakes and streams. **M. Nitrate and Nitrite-Nitrogen**
7. The primary factors that distinguish _____ from other land forms or water bodies is the dominance of hydrophytes; presence of undrained hydric soil; and saturation with water or covered by shallow water at some time during the growing season of each year. **T. Wetlands**
8. Plants that are not native to Iowa and cause environmental, economic, and human harm are considered _____. **J. Invasive species**
9. The use of living organisms to determine presence, amounts, changes in pollution, and effects of both abiotic and biotic factors in the environment is called a_____. **E. Biological assessment**
10. _____ pollution occurs when rainfall or snowmelt picks up pollutants as it moves over and through the ground, and deposits them in surface and ground waters. **N. Nonpoint source**

Multiple Choice (circle the correct answer)

11. The northern Great Plains contain many shallow wetlands called _____. These shallow depressions were created by the retreat of the glaciers during the last ice age 10,000 - 15,000 years ago.

    A. Tidal Marshes
    B. Glacier Marshes
    C. **Potholes***
    D. Bogs

12. A _____represents conditions that are least disturbed by human activities, and are used to set biological criteria for measuring the health of other waterbodies.

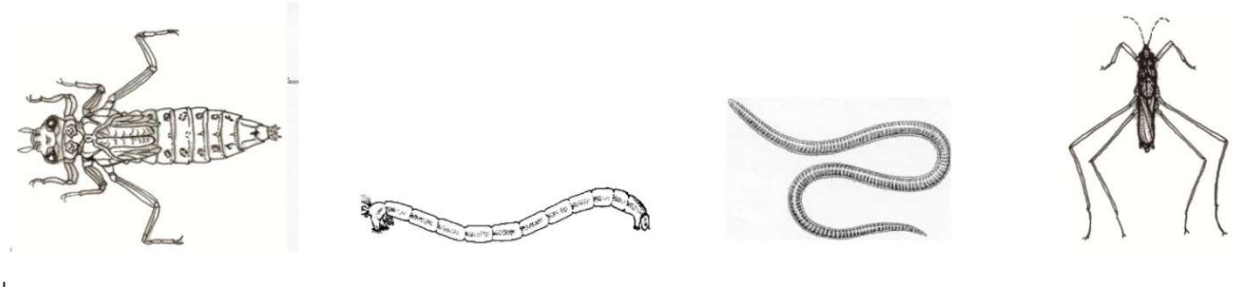
    A. High quality resource
    B. Reference site*
    C. Survey site
    D. Biological index
    E. Superfund site

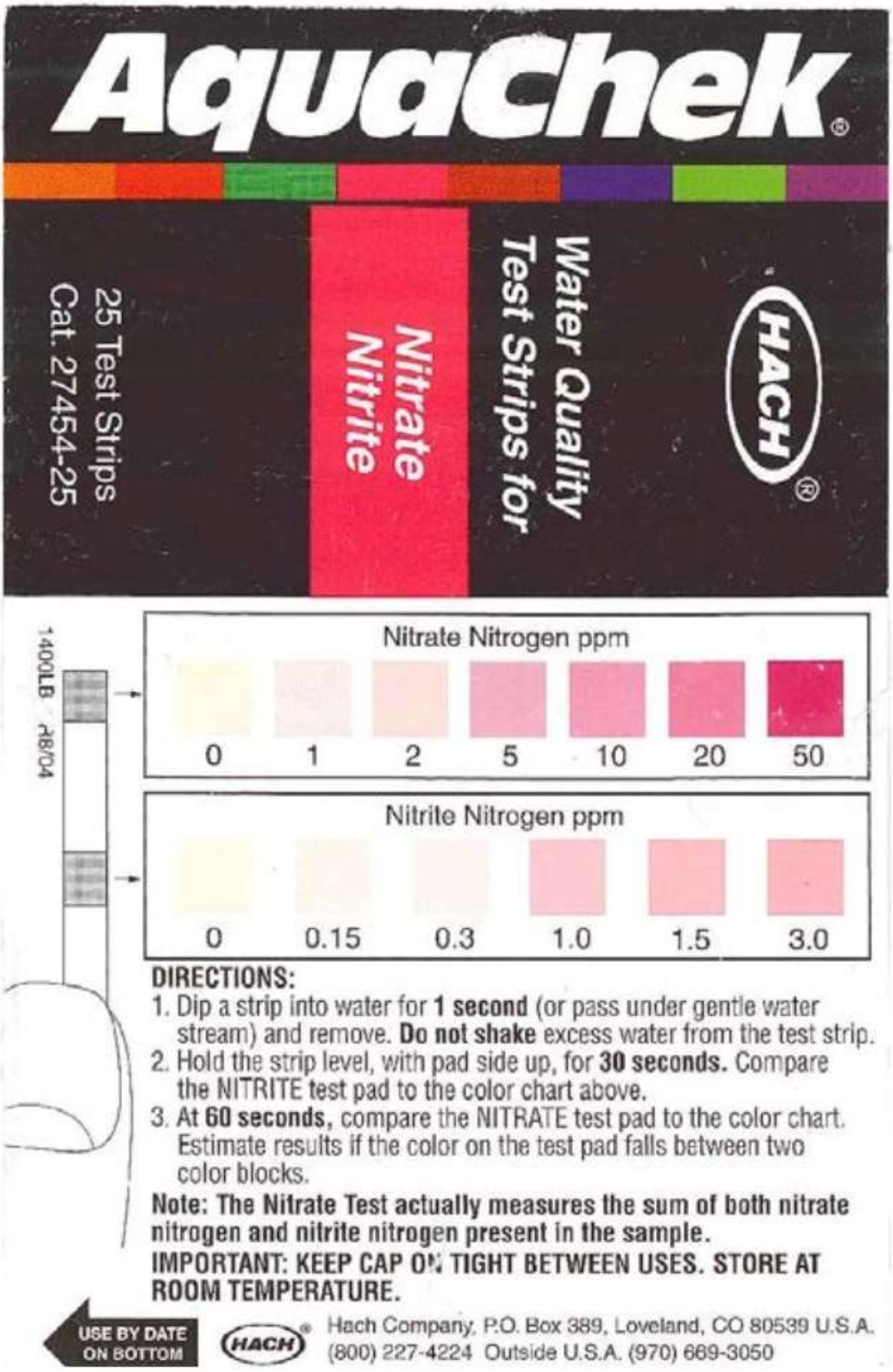
13. Which of the following is NOT one of the three major types of streams and rivers?

    A. Aquifer*
    B. Headwater
    C. Large Rivers and streams
    D. Wadeable

14. The organisms shown below were recently collected from a stream in Northern Iowa. By using the "Iowa Benthic Macroinvertebrate Key", identify the macroinvertebrates collected at this site, and rate the water quality of this stream, based on presence of these organisms. The presence of the macroinvertebrates shown below, would indicate a _____.

    A. High quality stream
    B. Moderate quality stream*
    C. Low quality stream
    D. The water quality of a stream does not affect the which macroinvertebrates are present





Note finger holding the test strip to illustrate the two pads and how each relates to its corresponding color scale to the right

Use the "Hach® nitrate-N/nitrite-N test strips" for Questions 15-17:

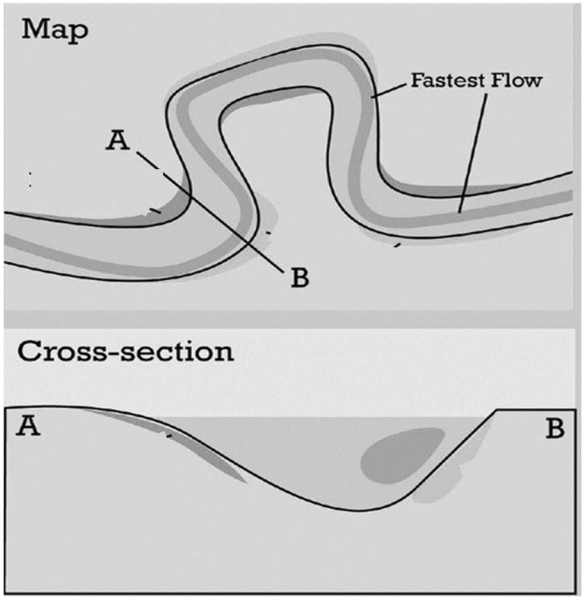
A. Use the Hach® nitrate-N/nitrite-N test strips to determine the nitrate and nitrite level of the aquatics area at this station. Review the directions on the Hach® nitrate-N/nitrite-N test strips vial and the steps outline below, and on the lable on the previous page, before you conduct the testing. **Obtain a water sample, a stop watch and a test strip from the station leader.** You will need to dip the test strip into the water and remove immediately. **DO NOT SHAKE** excess water from the test strip.
B. Hold the strip level, with pad side up, for **30 seconds.**
C. Compare the NITRITE (lower) test pad to the nitrite-nitrogen color chart on test strip bottle, estimate the nitrite concentration in mg/L, and record your reading for question #15 below (if wearing sunglasses, rmove them before reading the strip). ***This pad will continue to change color, so make a determination immediately after 30 seconds***.
D. At **60 seconds** (or 30 seconds after estimating nitrite concentration), compare the NITRATE (upper) test pad to the nitrate-nitrogen color chart on test strip bottle, estimate the nitrate concentration in mg/L, and record your reading on for question #16 below (remove sunglasses before reading the strip). ***The pad will continue to change color, so make a determination immediately after 60 seconds***.
E. Dispose of test strip in waste container

15. What nitrate value did you get with your test? _____

16. What nitrite value did you get with your test? _____

17. The amount of nitrate or nitrite dissolved in water is reported as nitrate-N (nitrate expressed as the element nitrogen) or nitrite-N in milligrams per liter of water (mg/L). Iowa's drinking water standard for nitrate is 10 mg/L as nitrate-N. Does your nitrate reading meet this quality standard?

A. Yes B. No



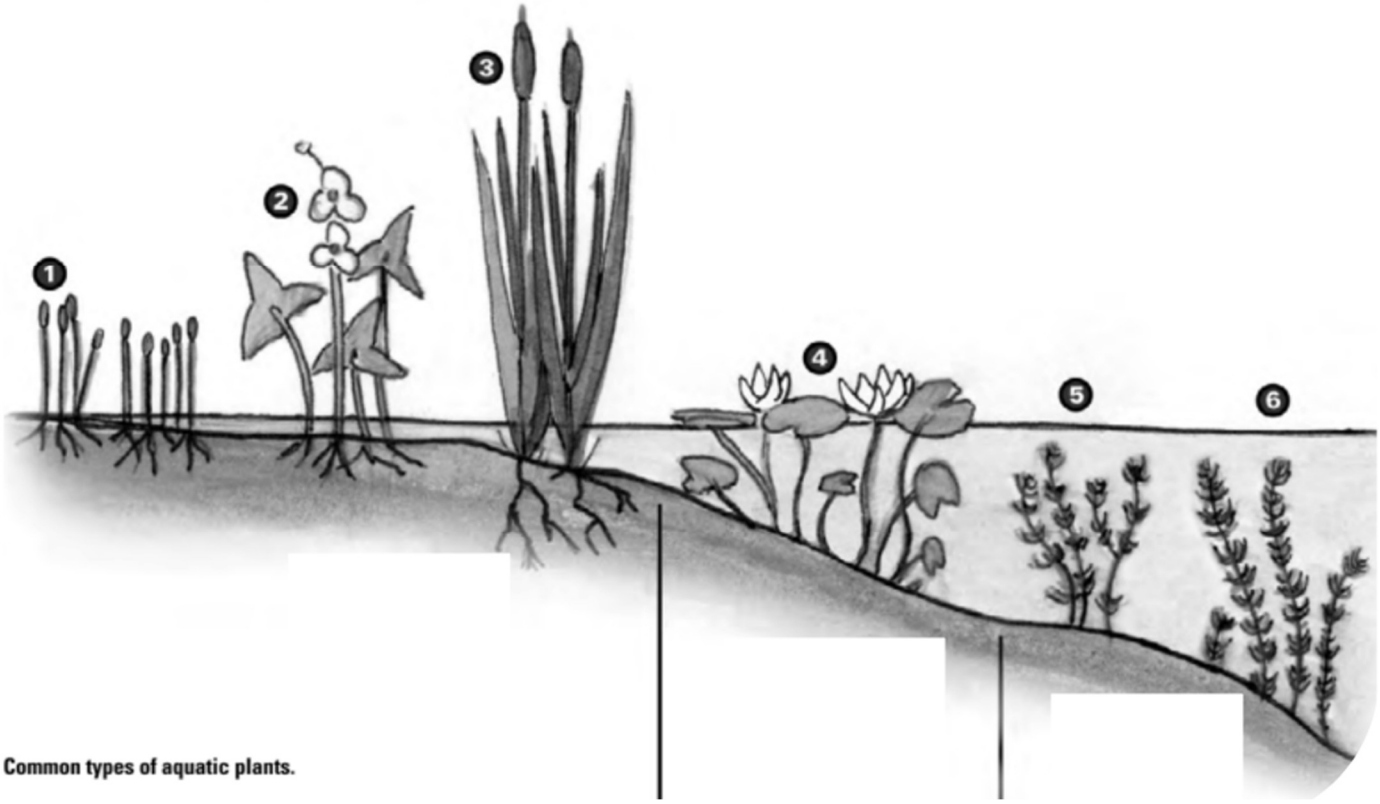
Study the diagram of a stream on the left. Answer the questions below (3 points each)

18. In the diagram to the left, identify the area where sediment deposition is most likely to occur (circle one):

A OR B **"A" is correct**

19. A curve in a stream as shown in the diagram to the left is called a/an

A. headwater
B. meander*
C. oxbow
D. thalweg



Common types of aquatic plants.

Identify Aquatics plant #2 and #4 in the diagram above

20. Aquatic plant #2 _____ **Arrowhead**

21. Aquatic plant #4 _____ **White water lily**

Possible answers:

Arrowhead	Spikerush
Cattail	Stonewort (Muskgrass)
Coontail	Water stargrass
Duckweed	White water lily
Longleaf pondweed	Wild celery
Slender naiad	

Identify the piece of aquatics equipment at this station

22. _____ **Secchi disk**

Possible answers:

Water avenger	Secchi disk
Cam line	Turbidity Sensor
Floppy disk	Zebra disk

Identify the fish species for questions 23-24

Possible answers: Bigmouth Shiner, Bluegill, Bluntnose Minnow, Central Stoneroller, Channel Catfish, Creek Chub, Green Sunfish, Johnny Darter, Northern Pike, Paddlefish, Smallmouth Bass, Trout-perch, Walleye, White Sucker, Yellow Perch

23. _____ **Johnny Darter**

24. _____ **White Sucker**

Identify the fish species for questions 25

Possible answers: Bigmouth Shiner, Bluegill, Bluntnose Minnow, Central Stoneroller, Channel Catfish, Creek Chub, Green Sunfish, Johnny Darter, Northern Pike, Paddlefish, Smallmouth Bass, Trout-perch, Walleye, White Sucker, Yellow Perch

25. _____ **Paddlefish**