

CT Envirothon Aquatics Exam 2019

Print the name of your Team/School on the line in the upper righthand corner of this page and **EACH** additional page. For each of the questions in this exam you will either circle the correct answer or fill in the blank space(s) provided.

All specimen identifications are included in the first half of the exam and you are allowed to use the provided keys to ID each organism. There are two questions per specimen and each specimen identification question number correlates to the specimen # (e.g. 1A and 1B). Each question from #1A – #22 is worth 3 points, and the bonus question #23 is worth 1 point. Questions #24 – #28 are focused on the current topic and worth 2 points each. **GOOD LUCK!!!**

Please utilize the *Keys to Marine Benthic Invertebrates* to identify the following organisms:

1A) Identify the species in container #1.

- | | |
|--------------------------------|--------------------------------|
| a) <i>Argopecten irradians</i> | b) <i>Cyclocardia borealis</i> |
| c) <i>Crepidula fornicate</i> | d) <i>Busycon carica</i> |

1B) What feeding strategy does the species in container #1 display?

- | | |
|---------------------|-----------------------|
| a) grazing | b) photosynthesis |
| c) active predation | d) suspension feeding |

Use *The Amphibians of Connecticut* to identify the following organisms:

2A) Identify the species in container #2.

- | | |
|-------------------------------|---------------------------|
| a) <i>Pseudacris crucifer</i> | b) <i>Rana clamitans</i> |
| c) <i>Rana palustris</i> | d) <i>Hyla versicolor</i> |

2B) What is the primary food source for the adult form of the species in container #2?

- | | |
|-------------|---------------------|
| a) fish | b) invertebrates |
| c) tadpoles | d) all of the above |

3A) What is the species in container #3?

- | | |
|-------------------------|---------------------------|
| a) <i>Rana pipiens</i> | b) <i>Hyla versicolor</i> |
| c) <i>Bufo amicanus</i> | d) <i>Rana sylvatica</i> |

3B) What is the range in Connecticut of the species in container #3?

- a) Northeastern Connecticut
- b) Coastal Connecticut
- c) Northwestern Connecticut
- d) Found in Every County in Connecticut

4A) What is the species in container #4?

- a) *Notophthalmus viridescens*
- b) *Ambystoma laterale*
- c) *Hemidactylium scutatum*
- d) *Eurycea bislineata*

4B) Adult forms of the species in container #4 live in what conditions?

- a) terrestrial
- b) aquatic

5A) What is the species in container #5?

- a) *Ambystoma maculatum*
- b) *Eurycea bislineata*
- c) *Plethodon cinereus*
- d) *Necturus maculosus*

5B) What habitats do the species in container #5 live in?

- a) Wooded terrestrial
- b) Freshwater springs and streams
- c) Vernal pools
- d) All of the above.

Use the *Connecticut Fish Key* to identify the following organisms:

6A) What species is in container #6?

- a) *Apeltes quadracus*
- b) *Ameiurus nebulosus*
- c) *Anguilla rostrata*
- d) *Notemigonus crysoleucus*

6B) What type of scales does the fish in container #6 have?

- a) lacks scales
- b) ctenoid
- c) cycloid
- d) placoid

7A) What species is in container #7?

- a) *Lepomis gibbosus*
- b) *Fundulus majalis*
- c) *Apeltes quadracus*
- d) *Menidia menidia*

7B) What is the ecology of the species in container #7?

- a) parasitic
- b) plankton feeder
- c) benthic herbivore
- d) mid-water predatory

Use the *Freshwater Mussels of CT Guide* for the following shell:

8A) What species is in container #8?

- a) *Anodonta imbecilis*
- b) *Elliptio complanata*
- c) *Lampsilis cariosa*
- d) *Strophitus undulatus*

8B) Is the species in container #8 protected through the State of Connecticut's Endangered and Threatened Species laws?

- a) No, it is common.
- b) Yes, it is endangered.
- c) Yes, it is threatened.
- c) No, it is an invasive.

Use the *Guide to Riffle Dwelling Macroinvertebrates* for the following organisms:

9A) What is the family in vial # 9?

- a) *Tipulidae*
- b) *Aeshnidae*
- c) *Elimidae*
- d) *Philopotamidae*

9B) What type of feeding group does the specimen in vial # 9 belong to?

- a) scraper
- b) collector-filterer
- c) predator
- d) gatherer

10A) What is the family in vial #10?

- a) *Pteronarcyidae*
- b) *Philopotamidae*

c) *Oligochaeta*

d) *Amphipoda*

10B) The family of organisms in vial #10 is an indicator of _____ water quality.

a) high

b) low

Use the *Invasive Aquatic Plants in CT Guide* for the following plant:

11A) What is the plant in photo #11?

a) *Marsilea quadrifolia*

b) *Najas flexilis*

c) *Trapa natans*

d) *Cabomba caroliniana*

11B) What methods help prevent the species in photo #11 and other aquatic plant species from spreading?

- a. Inspect and remove all visible plants, fish, and animals as well as mud at the boat launch.
- b. Empty all water from boats and other items before you leave the area you are visiting.
- c. Dry equipment, and if possible, allow for 5 days of drying time before entering new waters.
- d. All of the above

For the remaining questions on the exam, no ID guides or other reference materials may be used, unless indicated. All questions come directly from the workshop training session including many of the materials posted on the CT Envirothon website and are referenced for your future learning. Please ask station leaders if you have any specific questions as you work through the exam.

The following six questions are based on the “Watershed Jeopardy” session during the Aquatics 2019 Workshop.

12) A curved lake in a floodplain



- a) What is a vernal pool?
- b) What is an oxbow?
- c) What is a thermocline?
- d) What is an ephemeral stream?

13) A TMDL is the total amount of pollution a water body can receive and still meet water quality standards. What does it stand for?

- a) Total Minimum Depth Line
- b) Too Much Debris Left
- c) Total Maximum Daily Load
- d) Total Minimum Daily Load

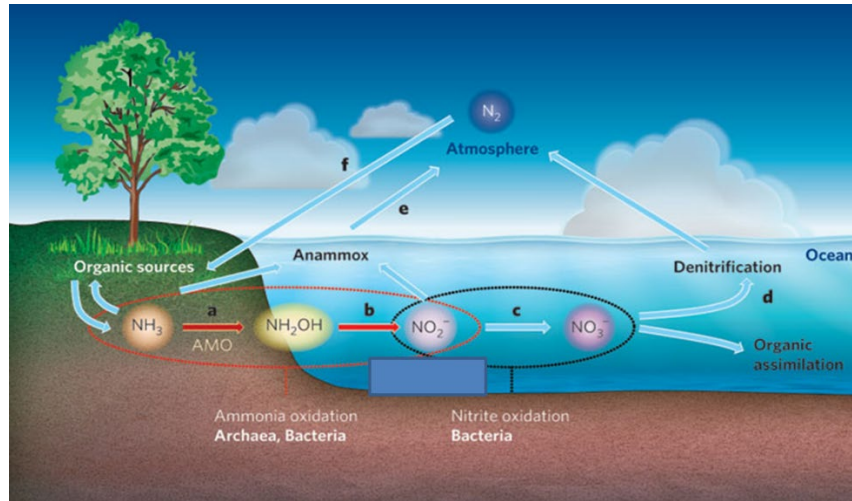
14) Bogs receive most of their water from this...

- a) What is the ocean?
- b) What is precipitation?
- c) What is groundwater?
- d) What are streams?

15) The build-up of this in irrigation water is a common problem for many agricultural operations and can lead to reduced production:

- a) What is soil?
- b) What is iron?
- c) What is salt?
- d) What is nitrogen?

16) The oxidation of ammonia to nitrate:



- a) What is nitrification?
- b) What is a respiration?
- c) What is precipitation?
- d) What is eutrophication?

17) This 1972 federal law regulates point source discharges to the nation's waters:

- a) What is The Resource Conservation and Recovery Act?
- b) What is the Comprehensive Environmental Response, Compensation, and Liability Act?
- c) What is the Clean Water Act?
- d) What is Safe Drinking Water Act?

The following four questions are based on the "Cyannobacteria/Water Quality" session during the Aquatics 2019 Workshop.

18) Which of the following are NOT true about cyanobacteria?

- a. They are photosynthetic prokaryotic organisms
- b. They only live in freshwater environments
- c. They are a threat to drinking water resources
- d. High density blooms can be toxic to humans, pets and other animals

- 19) Which of the following is NOT an example of a Sustainable Agricultural Practice that can increase or better water quality?
- a. Creation of medium-quality buffer strips
 - b. Use of fertilizers to better plant growth
 - c. Rotational grazing of animals
 - d. Use of cover crops
- 20) Which is a physical or chemical property that is NOT monitored to assess in-lake water quality?
- a. DO - Dissolved Oxygen
 - b. Temperature
 - c. Fluorine
 - d. Phosphorous
- 21) Alewives have sometimes been introduced into lakes, where they have not previously lived. What could the consequences of this action be?
- a. By eating cyanobacteria, Alewives could cause decreased toxic cyanobacteria blooms
 - b. By eating zooplankton, Alewives could cause increased toxic cyanobacteria blooms
 - c. An increase of alewives would have no effect on toxic algae blooms

The following four questions are based on the “Aquaponics” session during the Aquatics 2019 Workshop.

- 22) Aquaponics uses only _____ of the water of soil-based gardening, and even less water than hydroponics or recirculating aquaculture.
- a) 1/2
 - b) 1/4
 - c) 1/3
 - d) 1/10
- 23) ****BONUS**** If you could be one aquatic species what would you choose and why?

The following questions on the exam are directly focused on the Current Topic for 2019 “Agriculture and the Environment: Knowledge & Technology to Feed the World.” These questions are worth 2 points each. Please ask station leaders if you have any specific questions.

Each blank requires one answer. (*Current Issue: List of Resources document*).

Match up the USDA NRCS Wildlife Practices that benefit aquatic systems with the MOST APPROPRIATE description of the practice listed in the left hand column.

- | | |
|---|--|
| 35) Filter Strip | A) Methods for improving water quality, habitat conditions, and food resources for desirable fish species in ponds and to reduce competition from undesirable plants and animals. |
| 36) Wetland Restoration | B) The rehabilitation of a degraded wetland area back to the original wetland conditions. Wetlands provide important wildlife habitat for a large variety of species. |
| 37) Fish Pond Management | C) Establishment of features that improve water quality, provide in-stream habitat, increase diversity and stabilize stream banks to provide better physical and biological conditions for desirable aquatic wildlife species. |
| 38) Stream Habitat Improvement and Management | D) A strip of dense herbaceous vegetation adjacent to streams, ponds or other water bodies to reduce pollutants in surface water flows. They improve water quality for fish and other aquatic life. |
| 39) Riparian Forest Buffer | E) An area between a field and a stream, lake or other water body established to trees and/or shrubs to improve water quality for aquatic life. |