

CT Envirothon Aquatics Exam 2018

Print the name of your Team/School on the line in the upper right hand 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) *Argopecten irradians*
- b) *Cyclocardia borealis*
- c) ***Petricola pholadiformis***
- d) *Crassostrea virginica*

1B) Where will this species be found?

- a) Intertidal area, attached to rocks
- b) **bores into peat, sand or wood**

2A) Identify the species in container #2.

- a) ***Ilyanassa trivittata***
- b) *Kurtziella cerina*
- c) *Crepidula fornicata*
- d) *Mitrella lunata*

2B) What feeding strategy does the species in container #2 display?

- a) grazing
- b) **active predation**
- c) burrowing
- d) suspension feeding

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

3A) Identify the species in container #3.

- a) *Pseudacris crucifer*
- b) *Rana pipiens*
- c) ***Rana palustris***
- d) *Hyla versicolor*

3B) What is the primary food source for the adult form of the species in container #3?

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

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

- a) *Rana pipiens*
- b) *Hyla versicolor*
- c) *Bufo fowleri*
- d) *Rana sylvatica*

4B) What is the range in Connecticut of the species in container #4?

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

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

- a) *Notophthalmus viridescen*
- b) *Ambystoma laterale*
- c) *Ambystoma maculatum*
- d) *Necturus maculosus*

5B) Adult forms of the species in container #5 live in what conditions?

- a) terrestrial
- b) aquatic

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

6A) What species is in container #6?

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

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

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

7A) What species is in container #7?

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

7B) What is the geographic distribution of the fish in container #7?

- a) invasive
- b) **native**
- c) introduced
- d) fictitious

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

8A) What species is in container #8?

- a) **Anodonta implicata**
- 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.
- d) 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) *Philopotamidae*
- d) *Elimidae*

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) How does the species in photo #11 reproduce?

a) Seed propagation.

b) Fragmentation.

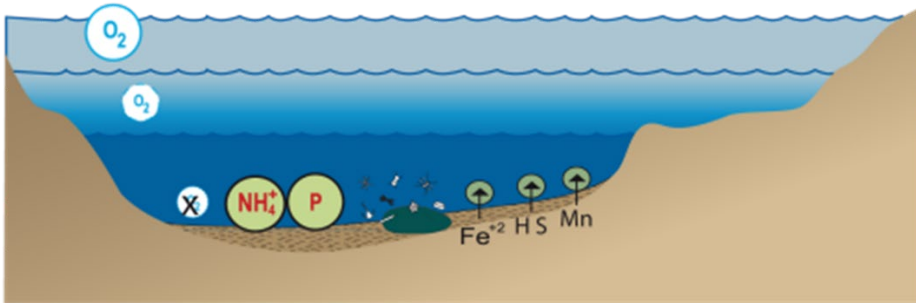
c) Rhizomes

d) Both A. Seeds and B Fragmentation.

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 2018 Workshop.

12) This is an upper part of a lake:



- a) What is sediment?
- b) What is the epilimnion?
- c) What is the thermocline?
- d) What is the hypolimnion?

13) BOD is the acronym for this test of lake productivity:

- a) What is base of depth?
- b) What is bottom of detritus?
- c) What is biological oxygen demand?
- d) What is phosphorous?

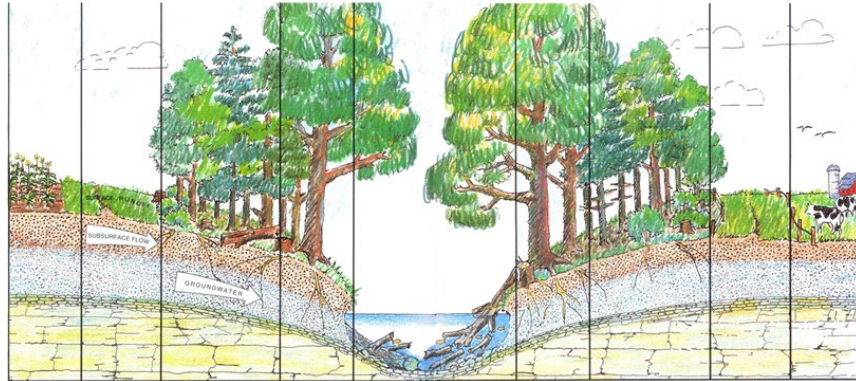
14) Term to describe a stream’s alternating flow from shallow and swift to deep and slow areas?

- a) What is lake effect?
- b) What is drought?
- c) What is alteration?
- d) What is rifle-pool sequence?

15) What is the largest source non-point source pollution in the US:

- a) What is agriculture?
- b) What is pavement?
- c) What is sewage?
- d) What is factories?

16) The area adjacent to a channel waterbody, where terrestrial and aquatic ecosystems converge:



- a) What is an oxbow?
- b) What is a grassland?
- c) What is the riparian zone?**
- d) What is a riffle?

17) This federal agency operates stream gages in CT rivers:

- a) What is NRCS?
- b) What is CTDEEP?
- c) What is USGS?**
- d) What is NPS?

The following two questions are based on the “Nonpoint Source Pollution: A Challenge to Control” session during the Aquatics 2018 Workshop.

18) Which of the following is **NOT** a major type of nonpoint source pollution?

- a) sediments
- b) pathogens
- c) oxygen**
- d) floatable debris

19) Low Impact Development (LID) is a form of _____, used to address urban storm water.

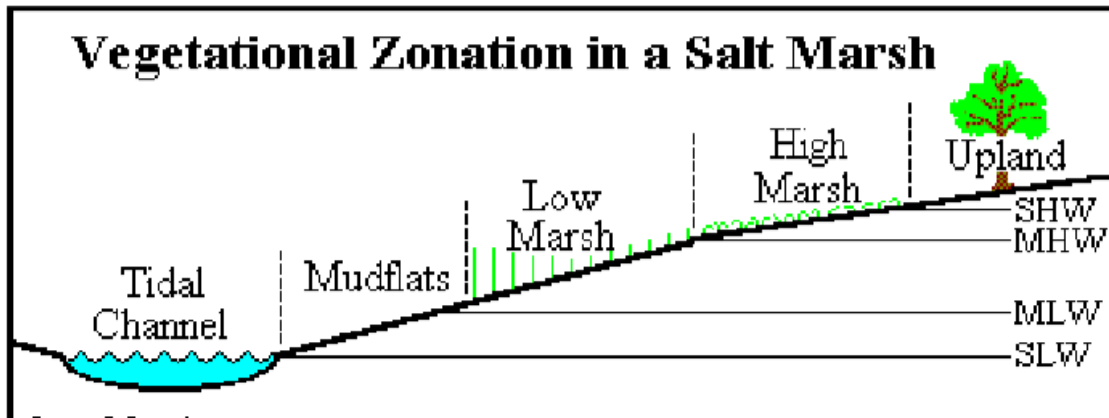
- a) regulation
- b) best management practice**
- c) permit
- d) investigation

The following three questions are based on the “Salt Marshes in Connecticut” session during the Aquatics 2018 Workshop.

20) Which of the following are main determining factors in the types of plants and animal found in a salt marsh:

- a) Frequency of Flooding
- b) Salinity
- c) Duration of Flooding
- d) All of the Above

Use the following image depicting Vegetational Zonation in a Salt Marsh to answer Questions #21 and #22.



21) What does MHW stand for in the image above:

- a) Marsh high wetland
- b) Minimum Half-Window
- c) Mean High Water
- d) Mixed Hazardous Waste

22) What zone of the Salt Marsh is located between Mean Low Water and Mean High Water?

- a) Mudflats
- b) High Marsh
- c) Tidal Channel
- d) Low Marsh

23) ****BONUS**** What has your team done to protect aquatic resources in your region?

(ANY answer receives 1 point)

The following questions on the exam are directly focused on the Current Topic for 2016 “Eastern Grasslands.” These questions are worth 2 points each. Please ask station leaders if you have any specific questions. (*Current Issue: List of Resources document*).

1. What happens when manure runs off into streams and ponds?
 - a) The nitrogen and phosphorus in the manure fertilizes algae and other aquatic plants.
 - b) Excessive growth of algae and other aquatic plants leads to oxygen starvation.
 - c) Fish and other aquatic animals die as a result of oxygen starvation
 - d) All of the above

2. Manure should NOT be spread in the winter. Why?
 - a) Freezing reduces the nutrients
 - b) Plants are not growing in the winter
 - c) Frozen ground will cause it to run off into surrounding rivers and wetlands
 - d) Keeping the manure in the barn keeps the barn warm

3. Which of the following is not a use for manure?
 - a) Garden compost
 - b) Making biodegradable seed-starting pots
 - c) Extracting heat
 - d) Construction material
 - e) Making erosion control structures for streams

Western rangelands

4. Wet habitats, where water and land meet, are important to livestock, sage grouse and other wildlife species. How much land in the west is comprised of wet habitats?
 - a) 20 percent
 - b) 10 percent
 - c) 5 percent
 - d) Less than 2 percent

5. Sagebrush helps retain water on rangelands by
 - a) Holding on to snow so it melts in place instead of blowing away
 - b) Soaking up rain through the leaves and putting it into the ground
 - c) Keeping water in its roots
 - d) Absorbing moisture from the air