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CT Envirothon Aquatics Exam 2014

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. Each question from #1-#33 is worth 3 points, question the ID Bonus question and #34 are worth 1 point each. Questions #35- #39 are focused on the current topic and worth 2 points each. **GOOD LUCK!!!**

Please utilize the *Key to Saltwater Invertebrates* to identify the following organisms:

1) Identify the species in container #1.

a) *Hemigrapsus sanguineus* b) *Carcinus maenas*

c) *Homarus americanus* d) *Crepidula fornicata*

2) Is the specimen in container #1 considered a native or invasive species to Long Island Sound?

a) native b) invasive

3) Identify the species in container #2.

a) *Busycotypus canaliculatus* b) *Argopecten irradians*

c) *Crassostrea virginica* d) *Mya arenaria*

4) Which habitat does the species in container #2 prefer?

a) Attached to hard structures such as rocks b) Shallow sand flats

c) Buried in thick mud in wetlands d) Mid-water swimming

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

5) Identify the species in container #3.

a) *Plethodon cinereus* b) *Ambystoma maculatum*

c) *Desmognathus fuscus* d) *Eurycea bislineata*

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6) What habitat does the species in container #3 require for reproduction?

a) a stream
b) the ocean
c) a vernal pool
d) terrestrial

7) What is the species in container #4?

a) *Rana clamitans*
b) *Pseudacris crucifer*
c) *Rana sylvatica*
d) *Rana catesbeiana*

8) Is the species in container #4 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) Yes, it is extinct in the wild

9) What is the species in container #5?

a) *Plethodon glutinosus*
b) *Notophthalmus viridescens*
b) *Ambystoma laterale*
d) *Ambystoma maculatum*

10) What does the species in container #5 eat?

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

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

11) What species is in container #6?

a) *Apeltes quadracus*
b) *Anguilla rostrata*
c) *Esox americanus*
d) *Lepomis macrochirus*

12) Does the fish in the container #6 display live in freshwater or saltwater?

a) freshwater
b) saltwater

13) What species is in container #7?

a) *Pseudopleuronectes americanus* b) *Fundulus* sp.

c) *Menidia menidia* d) *Catostomus commersoni*

14) What type or reproductive migration does the fish in container #7 display?

a) catadromous b) anadromous

c) amphidromous d) non-migratory

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

15) What species is in container #8?

a) *Pyganodon cataracta* b) *Ligumia nasuta*

c) *Alasmidonta undulata* d) *Elliptio complanata*

16) What type of sediment can the species in display #8 inhabit?

a) sand b) gravel and cobble

c) deep muds and silts d) all of the above

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

17) What is the family in vial # 9?

a) *Gomphidae* b) *Leuctridae*

c) *Perlidae* d) *Elimidae*

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

a) scraper b) filterer

c) predator d) gatherer

19) What is the family in vial #10?

a) *Perlidae* b) *Corydalidae*

c) *Pyralidae* d) *Glossosomatidae*

20) Is this species an indication of high quality or low quality water and habitat conditions?

a) high quality b) low quality

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

21) What is the plant in photo #11?

a) *Egeria densa* b) *Trapa natans*

c) *Potamogeton crispus* d) *Myriophyllum aquaticum*

22) Which is NOT a component of the "Clean, Drain, Dry Technique" for preventing transport of invasive aquatic plants via recreational boats?

a) Inspect and remove all visible plant, fish, animals and mud at the boat launch.

b) Bring home the plants and animals you find and keep them in a fish tank.

c) Eliminated all water from every conceivable space and item before you leave the area you are visiting.

d) Dry equipment, if possible, allow for five days of drying time before entering new waters.

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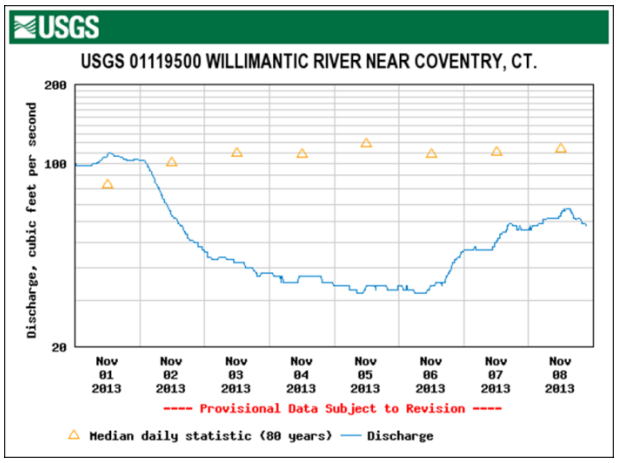
For the remaining questions on the exam, no ID guides or other reference materials may be used, unless indicated. All questions come directly from the workshop training session including many of the materials posted on the CT Envirothon website and are referenced for your future learning. Please ask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

The following four questions are based on the "Watershed Jeopardy" session during the Aquatics 2014 Workshop.

23) This type of graph:



a) What is a thermograph?

b) What is a pictograph?

c) What is a bar chart?

d) What is a hydrograph?

24) Groundwater makes up this percentage of the world's fresh water

a) What is 70%?

b) What is 30%?

c) What is 5%?

d) What is 2.5%?

25) This surface of water below the ground

a) What is the Water Table?

b) What is the "A" Horizon?

c) What is the Unsaturated Zone?

d) What is the Epilimnion?

26) The process of converting nitrate found in the soil to atmospheric nitrogen

a) What is nitrification?

b) What is biological oxygen demand (BOD)?

c) What is oxidation?

d) What is eutrophication?

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The following four questions are based on the "Aquatic Sampling Techniques" session during the Aquatics 2014 Workshop.

Use the photo below to answer Questions #27-29.

27) What is the approximate percent cover of eelgrass in the photo above?

a) ~ 5 %

b) ~ 85 %

c) ~ 25 %

d) ~2.5 %

28) When would a scientist choose to estimate percent cover versus collect abundance data?

b) When organisms are mobile and can move independently

b) When there are target species with clear separation and limited number of individuals

c) When conducting a walking survey

d) When target species include plants which may have various leaves, or organisms that grow in a colonial form where individual organisms are hard to distinguish from one another.

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The following three questions are based on the "Aquatic Sampling Equipment" session during the Aquatics 2014 Workshop.

Based in the following Scenario, answer the three questions below:

You are a freshwater ecologist asked to measure depths in a lake and take samples for zooplankton at different depths. This will require you to use a boat to get to the middle of the lake.

31) Which of these types of net is best used to sample zooplankton in the lake?

a) kick net
b) plankton net
c) dip net
d) a seine

29) What type of personal protective gear is MOST suitable for this task?

a) Personal floatation device
b) parachute
c) Respirator
d) steel-toed boots

30) The project manager calls and asks if you can collect a sediment sample in the middle in the lake (20 ft. of water depth), at a depth of 30 ft. under the sediment surface in addition to your other tasks. You only have a PONAR dredge with you. What is the BEST response to this request?

a) "Absolutely, we have a PONAR dredge with us!"

b) "Sure, I will wade in and grab the sediment sample."

c) "No, we only have a PONAR dredge that can sample surface sediment. We will have to come back with the proper equipment if you need that data."

d) "No, we don't want to."

The following two questions are based on the "Nonpoint Source Pollution: A Challenge to Control" session during the Aquatics 2014 Workshop.

32) The Clean Water Act of 1972 required permitting for which type of pollutants?

a) Non-point Source
b) Point Source

33) The following are major sources of nonpoint source pollution EXCEPT:

a) Urban stormwater
b) Agriculture
c) Construction Sites
d) Industrial Facility Outlet Pipes

34) ****BONUS**** What is you team's favorite water-based activity?
(ANY answer receives 1 point)

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The following questions on the exam are directly focused on the Current Topic for 2014 "Sustainable Agriculture." The materials posted on the CT Envirothon website are referenced for your future learning. These questions are worth 2 points each. Please ask station leaders if you have any specific questions.
(Current Issue: List of Resources document)

35) Which principle resource has been a major limiting factor to farming when mismanaged?

a) Energy
b) Water
c) Air
d) Livestock

36) What is a common result of drought causing an overdraft of groundwater:

a) Eutrophication
b) High ground water table
c) Intrusion of salt water
d) Sediment deposition

37) Which is NOT a step that can be taken to develop drought resistant farming?

a) using reduced-volume irrigation systems
b) not planting at all
c) improving water conservation and storage measures
d) pumping out all groundwater

38) Water quality can be impacted by agriculture through contamination of ground and surface water by:

a) pesticides
b) nitrates
c) salinization
d) All of the above

39) Which of the following can support a diversity of wildlife in water resources adjacent to agricultural uses?

a) Maintenance of plant diversity
b) Destruction of riparian habitat
c) Conversion of wildlife habitat to agricultural land
d) Paving upgradient watershed areas