CT Envirothon Aquatics Exam 2013

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) *Euspira heros*

c) *Littorina littorea*   d) *Urosalpinx cinerea*

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

a) native   b) invasive

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

3)   Identify the species in container #3.

a) *Necturus maculosus*   b) *Ambystoma maculatum*

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

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

a) a stream   b) the ocean

c) a vernal pool   d) a lake

5)   What is the species in container #4?

a) *Rana clamitans*   b) *Pseudacris crucifer*

c) *Rana sylvatica*   d) *Rana catesbeiana*

6) Is the species in container #3 protected in the State of Connecticut?

a) No, it is common.   b) Yes, it is endangered.

c) Yes, it is threatened.   c) Yes, it is extinct in the wild

7) What is the species in container #5?

a) *Plethodon glutinosus*   b) *Notophthalmus viridescens*

b) *Ambystoma laterale*   d) *Plethodon cinereus*

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

a) fish   b) invertebrates

c) tadpoles   d) all of the above

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

9) What species is in container #6?

a) *Micropterus salmoides*   b) *Anguilla rostrata*

c) *Esox americanus*   d) *Anchoa mitchilli*

10) What type or reproductive migration does the fish in container #6 display?

a) catadromous   b) anadromous

c) amphidromous   d) potamodromous

11) What species is in container #7?

a) *Pseudopleuronectes americanus* b) *Notemigonus crysoleucas*

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

12) What type of scales does the species in container #7 have?

a) placoid   b) ganoid

c) cycloid   d) ctenoid

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

13)   What species is the shell #8?

a) *Anodonta implicata*   b) *Dreissena polymorpha*

c) *Alasmidonta undulata*   d) *Ligumia nasuta*

14) ___What are two threats that freshwater mussels are most vulnerable to?

a) drowning and drying up   b) flooding and smothering

c) disturbance and pollution   d) freezing and thawing

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

15)   What is the family in vial # 9?

a) *Gomphidae*   b) *Corydalidae*

c) *Glossosomatidae*   d) *Elimidae*

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

a) scraper   b) filterer

c) predator   d) gatherer

17)   What is the family in vial #10?

a) *Perlidae*   b) *Psephenidae*

c) *Pyralidae*   d) *Glossosomatidae*

18)   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:

19) What is the plant in photo #11?

    a) *Myriophyllum heterophyllum*   b) *Najas minor*

    c) *Hydrilla verticillata*   d) *Myriophyllum spicatum*

20) What type of leaf structure does the plant in photo # 11 have?

    a) Alternate   b) Simple

    c) Opposite   d) Whorled

21) What is the plant in photo #12?

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

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

22) What is a potential ecosystem impact from invasive aquatic plants?

    a) Lower property values   b) Reduce recreation

    c) Clarify surface water   d) Displace native species.

**BONUS ID ** 1 Point **
This species is NOT included in the Connecticut Fish Key.

What is the species in container # 13?

    a) *Syngnathus fuscus* (northern pipefish) b) *Squalus acanthias* (spiny dogfish)

   c) *Lophius americanus* (goosefish)   d) *Ophidion marginatum* (striped cusk eel)

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.

23) Which of the following individual fish has the longest standard length?

a)

b)
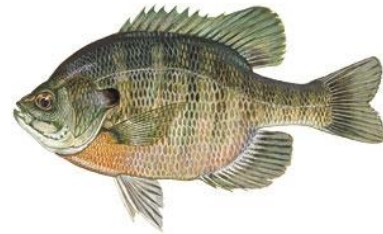
c)

d)

The following three questions are based on the "Watershed Jeopardy" session during the Aquatics 2013 Workshop.

24) A curved lake in a floodplain

    a) What is a kettle?
        b) What is a seiche?

    c) What is the Epilimnion?
        d) What is an oxbow?

25) This happens around the well when pumping

    a) What is advection?
        b) What is dispersion?

    c) What is drawdown or the cone of depression?
    d) What is potential?

26) A five day oxygen test for productivity

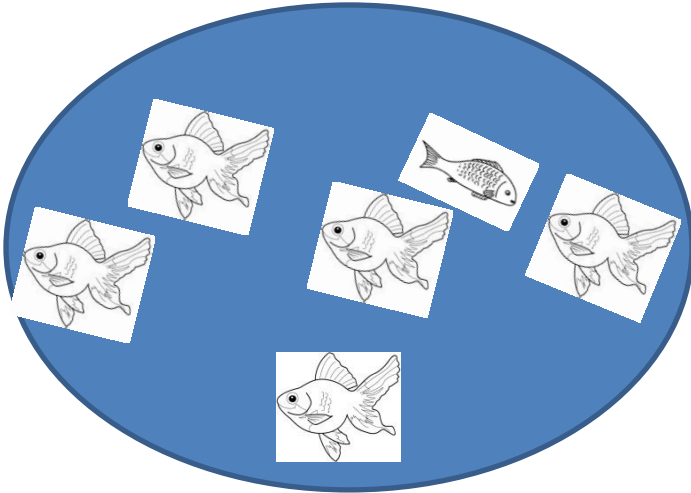   a) What is nitrification?
        b) What is biological oxygen demand (BOD)?
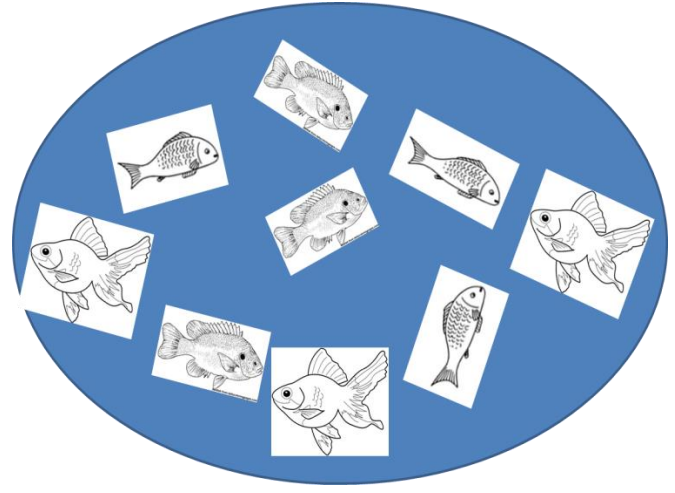
    c) What is integrated sampler?
    d) What is rapid bioassessment protocol?

The following four questions are based on the "Aquatic Sampling Techniques" session during the Aquatics 2013 Workshop.

Pond A   Pond B

27) Which pond has the higher species richness?

   a) Pond A   b) Pond B

28) Simpson's diversity index is to calculate species diversity. This metric:

   a) Does NOT take into account either species richness and relative evenness
   b) Calculates species richness
   c) Calculates relative species evenness.
   d) Takes into account both species richness and relative evenness

29) Calculate Simpson's Diversity index for **POND B** using the following equation:

$$D = \frac{N(N-1)}{\sum n(n-1)}$$

Where: D= diversity

       N= total number of individuals counted

       n= numbers of each different species

   a) 0.50   b) 0.05
   c) 0.25   d) 1.0

30) Why are sampling techniques such as quadrat and transect sampling important?

a) It is often impossible to count every living organism in a given area

b) They provide an estimate of biodiversity in a short amount of time.

c) The techniques can be easily replicated

d) All of the above.

The following three questions are based on the "Aquatic Sampling Equipment" session during the Aquatics 2013 Workshop.

31) Which of these types of net is best used to sample egg masses suspended in the water of a vernal pool?

a) kick net   b) plankton net

c) dip net   d) a seine

32) If the project at hand requires sampling sediment within the top six inches of the sediment surface in a river that is 20 feet deep, which sampling equipment is best?

a) a petit PONAR   b) a 6 ft. push core

c) a hand shovel   d) a surface water sampler

33) A water quality meter can measure all of the following parameters EXCEPT:

a) Dissolved Oxygen   b) pH

c) Biological Oxygen Demand   d) Conductivity

34) If you and your teammates could have an adaptation of any aquatic organism what would it be?

(ANY answer receives 1 point)

The following questions on the exam are directly focused on the Current Topic for 2012 "Habitat Management." 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.

Each blank requires one answer. *(Current Issue: CT Comprehensive Wildlife Conservation Strategy).* Match up the actions with that MOST APPROPRIATE cause resulting in the threats to marine, freshwater and anadromous species of greatest conservation need listed in the left hand column.

35) Loss, degradation, or fragmentation of habitats. . _____C_____ .

36) Unintentional damage, injury or mortality. _____E_____ .

37) Loss of cold water habitat. . _____A_____ .

38) Impacts/competition for prey species. _____B_____ .

39) Loss of oxygenated hypo-limnetic and meta-limnetic zones. . _____D_____ .

A) Wetland filling, impoundments resulting in decreased groundwater flow or increased warming.

B) Predation by striped bass in the CT River

C) Stream channel modifications, dams, and development.

D) Excessive nutrient runoff and vegetation control.

E) Incidental catch, injuries from fishing gear.