

# CT Envirothon Aquatics Exam 2006

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 within the first third of the exam and you are allowed to use the provided keys to ID each organism. There are 40 total questions so each one is worth 2.5 points, use your time wisely. **GOOD LUCK!!!**

**Use the “Field Guide to Freshwater Mussels of CT” for this question.**

- 1) What species of mussel are you examining?  
a) *Lampsilis radiata*                      b) *Alasmidonta heterodon*  
  
c) *Alasmidonta undulata*                d) *Anodonata implicata*

**Use the Salamander Guide to ID these specimens**

- 2) What species of salamander is this?  
a) *Desmognathus f. fuscus*      b) *Eurycea bislineata*  
  
c) *Hemidactylium scutatum*    d) *Plethodon cinereus*
- 3) What species of salamander is this?  
a) *Gyrinophilus p. parphyriticus*      b) *Notophthalmus v. viridescens*  
  
c) *Plethodon cinereus*                      d) *Eurycea bislineata*

**Use Identification Key to the Most Common Freshwater Benthic Invertebrates for the next questions**

- 4) What is the family of organism in vial #4?  
a) Simuliidae                                  b) Athericidae  
  
c) Corydalidae                                d) Tipulidae
- 5) What is the family of organism in vial #5?  
a) Perlidae                                      b) Aeshnidae  
  
c) Ephemerellidae                            d) Leptoceridae
- 6) What is the family of organism in vial #6?  
a) Pteronarcyidae                            b) Psephenidae  
  
c) Oligoneuriidae                            d) Diptera

**Use the “Abbreviated Key to Freshwater Fishes” for the next 2 questions.**

- 7) What is the fish specimen in tray #7?  
a) *Lepomis gibbosus*                      b) *Anguilla rostrata*  
c) *Lepomis macrochirus*                d) *Peca flavescens*
- 8) What is the fish specimen in tray #8?  
a) *Catostomus commersoni*    b) *Ictalurus punctatus*  
c) *Salmo salar*                                d) *Cyprinus carpio*

**Use the “Abbreviated Key to Saltwater Fishes” for the next 2 questions**

- 9) What is the fish specimen in tray #9?  
a) *Stenotomus chrysops*                      b) *Centropristis striata*  
c) *Salmo salar*                                      d) *Alosa sapidissima*
- 10) What is the fish specimen in tray #10?  
a) *Alosa pseudoharengus*                      b) *Alosa sapidissima*  
c) *Dorosoma cepedianum*                      d) *Carassius auratus*

**Use the Abbreviated Key to Saltwater Invertebrates for the next 3 questions**

- 11) What organism is located in the cooler?  
a) *Carcinus maenas*                              b) *Callinectes sapidus*  
c) *Carcinus irroratus*                              d) *Aurelia aurita*
- 12) What organism is this?  
a) *Crepidula fornicata*                              b) *Littorina littorea*  
c) *Euspira heros*                                      d) *Urosalpinx cinerea*
- 13) What is this organism?  
a) *Busycon carica*                                      b) *Busycotypus canaliculatus*  
c) *Crassostrea virginica*                              d) *Architeuthis dux*

**You may use the Aquatics Guide on Invasive Plants for this question.**

- 14) What type of aquatic invasive plant is this a picture of?  
a) *Cabomba caroliniana*                              b) *Najas minor*  
c) *Hydrilla verticillata*                              d) *Lactuca sativa*

**The remainder of the test is based on the materials given to you on CD. These questions were all pulled from those materials and will test your knowledge and understanding of said materials.**

- 15) According to the Long Island Sound Report 2003 (pg. 4 *Nitrogen Pollution and Hypoxia*) Hypoxia occurs in LIS from Mid-July through September. What is the definition of hypoxic conditions in this document?
- a) Dissolved Oxygen levels are more than 14 mg/L
  - b) Dissolved Oxygen levels = consumption rates
  - c) Dissolved Oxygen levels are less than 3 mg/L
  - d) Dissolved Oxygen levels exceed consumption rates
- 16) In Sound Health 2003 on page 13, *Hemigrapsus sanguineus* is identified as an invasive species recently introduced and quickly taking over habitat in Long Island Sound. What type of animal is it?
- a) fish
  - b) crab
  - c) mussel
  - d) worm
- 17) Global Climate Models (GCMs) based on a doubling of CO<sub>2</sub> suggest mean increases in precipitation and evaporation of between 3-15%. According to the GCMs, what are possible outcomes of these increases? (Water and Climate Change from Canada pg3)
- a) snowmelt and spring runoff would occur earlier than present
  - b) the interior region of the northern hemisphere will experience drier summers
  - c) more permanent waterbodies such as lakes will form
  - d) a and b
  - e) a and c

**Please use only the words located in the box to fill in the blanks in the following paragraph. Each word may only be used once and not every word will be used. All 3 questions can be answered from Water Quality Standards from 2002 and the 2002 Water Quality Fact Sheets**

Rocky Neck State Park has a designated public swimming area. Decisions to close beaches in designated areas are determined by (18)\_\_\_\_\_ levels in the water. The monitoring results for each beach are reported by the CT Department of Public Health. Results of any single sample from a salt water beach over (19)\_\_\_\_\_, will result in additional testing and possible closure of the beach. Beach monitoring only occurs between Memorial Day and Labor Day, outside of these dates, (20)\_\_\_\_\_ located north of I-95 are not required by state law to disinfect their effluent.

-heavy metals -residences  
 -paint -2000 cols/100mls  
 -indicator bacteria -jellyfish  
 -104 cols/100ml -schools  
 -treatment plants  
 -576 cols/100ml - factories

- 21) What is considered the Number One threat to water quality by the EPA? (Clean Water fact sheet pg1)
- a) heavy metal discharges
  - b) nonpoint source pollution
  - c) atmospheric deposition of mercury
  - d) heavy metal concerts

22) Please rank the following soil types in order of **highest infiltration rate to the lowest**: (each

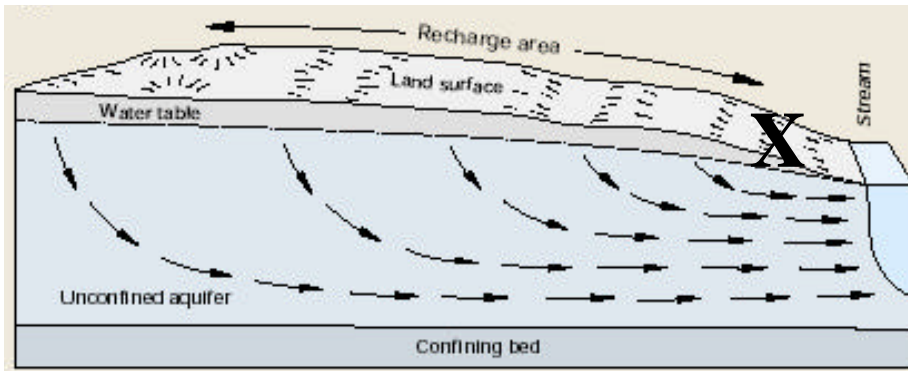
--fine textured/similar sized particles --fine textured clay --coarse textured/similar sized particles --coarse textured/variable sized particles --concrete

**correct answer is .5 pts**) (What Happens to Water pg.11)

- a) \_\_\_\_\_ b) \_\_\_\_\_ c) \_\_\_\_\_ d) \_\_\_\_\_  
 e) \_\_\_\_\_

23) In the following picture a nearby stream is flowing and is currently experiencing recharge from ground water flow. If a well is placed at the (X), and water is pumped at a very high rate, which of the following may occur? (USGS circular 1139 pg 15)

- a) The well will result in no water pulled from underground
- b) The well will begin pulling stream water into the aquifer
- c) The well will force the groundwater to flow to the left of the picture
- d) The well will be an artesian well



24) The water table is the top of \_\_\_\_\_? (Citizens Guide to Groundwater pg1)

- a) a waterfall
- b) the saturated zone
- c) a pond
- d) the confining bed

25) Which of the following is NOT an input of Nitrogen to lawns? (Stormwater Center Article #4 Nutrient Movement from Lawn to Stream pg.25-26)

- a) atmospheric deposition
- b) fertilizers
- c) fixation by plants
- d) sunlight

26) Stormwater Center Article #126 Understanding Watershed Behavior discusses 6 major human behaviors that can have an impact on local water quality. List the 5 of the 6. (**each correct answer is worth .5 points**)

1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_  
 4. \_\_\_\_\_ 5. \_\_\_\_\_

- 27) In the EPA document, "Protecting Water Quality from Urban Runoff", lists several things homeowners can do to decrease polluted runoff. Only one of the following is on the list, circle the correct choice.
- a) remove all grass and replace with concrete   b) use bottled water in your garden  
c) use a broom to clean driveways not a hose   d) reduce trips to the car wash
- 28) Hydrilla is an aquatic invasive plant found in Connecticut. Primarily how does this plant reproduce? (*Invasive Aquatic Weeds pg 5*)
- a) seeds      b) new sprouts from broken stems   c) flowers      d) germification
- 29) Which of the following is NOT an Obligate species in vernal pools? (*Wicked Big Puddles pg5*)
- a) wood frog      b) fairy shrimp      c) spring peeper      d) mole salamanders
- 30) Which of the following is NOT a beneficial function of vegetated buffers? (*Buffer fact sheet pg1*)
- a) increase surface flow   b) absorb nutrients   c) increase infiltration   d) decrease surface flow
- 31) The venter of the salamander is also know as ? (*salamander terminology*)
- a) top      b) bottom      c) side      d) cooling system
- 32) Organisms that go through a complete metamorphosis will go through the following life cycle: egg-→ larvae-→ \_\_\_\_\_-→ adult. What is the blank stage? (*Riverwatch macro guide pg 3*)
- a) subimago      b)pupa      c) molt      d) middle
- 33) Aquatic invertebrates have developed a wide range of adaptations to assist with survival in riffle habitats. Which following adaptation would be beneficial in the fast flowing riffle stream habitat? (*Riverwatch macro guide pg7*)
- a) sticky secretions   b) large bulky body   c) light weight      d) bright colors
- 34) What is the air-speed velocity of an unladen swallow? (*Monty Python's Holy Grail*)
- \_\_\_\_\_

- 35) What animal must be absent for a waterbody to even be considered a vernal pool? (*Wicked Big Puddles pg4*)
- a) wood frog   b) dragonfly nymph   c) fish   d) caddisfly larvae
- 36) What was the size of the hypoxic area in Long Island Sound in 2002? (*Sound Health 2003 pg 4*)
- a) 130 square feet   b) 130 square inches   c) 130 square miles   d) 2 square miles
- 37) A lake that is considered Oligotrophic with 0-10 ug/L of Total Phosphorous in spring and summer has a \_\_\_\_\_ potential for water contact recreation? (*Water Quality Standards pg13*)
- a) limited   b) extremely limited   c) high   d) extremely severely limited
- 38) The “What Happens to Water” document defines four methods/pathways that water can leave a watershed after precipitation events. Which of the following is not on their list?
- a) flooding   b) groundwater recharge   c) storage   d) surface runoff
- 39) Which of the following is not an impervious surface? (*Chapter 2 Stormwater manual*)
- a) parking lot   b) roads   c) grassy fields   d) building roofs
- 40) Looking at the TOPO map of Rocky Neck State Park and surrounding landscape, what is **the #1** most likely reason for potential beach closures in the park?

\_\_\_\_\_