

CT Envirothon Aquatics Exam 2010

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 third of the exam and you are allowed to use the provided keys to ID each organism. Each question is worth 3 points except for question #34, which is worth only one. **GOOD LUCK!!!**

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

- 1) What is the species in container #1?
 - a) Limulus Polyphemus
 - b) Mya arenaria
 - c) **Cancer irroratus**
 - d) Carcinus Maenas
- 2) What is the species in container #2?
 - a) **Busycotypus canaliculatus**
 - b) Mercenaria mercenaria
 - c) Urosalpinx cinerea
 - d) Nucella lapillus
- 3) What is the species in container #3?
 - a) Busycon carica
 - b) **Crepidula fornicate**
 - c) Argopecten irradians
 - d) Callinectes sapidus

Use the *CT Salamanders Guide* to identify the following organisms:

- 4) What is the species in container #4?
 - a) **Plethodon cinereus**
 - b) Plethodon glutinosus
 - c) Notopthalmus viridens
 - d) Eurycea bislineata

Use the *Saltwater Fishes Guide* to identify the following organisms:

- 5) What is the species in tray #5?
 - a) Etropus microstomus
 - b) Alosa sapidissima
 - b) **Centropristis striata**
 - d) Stenotomus chrysops

- 6) What is the species in tray #6?
- | | |
|-----------------------------------|----------------------------|
| a) Cynoscion regalis | b) <i>Morone saxatilis</i> |
| c) <i>Pleuronectes americanus</i> | d) <i>Tautoga onitis</i> |

Use the *Freshwater Fishes Guide* to identify the following organisms:

- 7) What species is in tray #7?
- | | |
|---------------------------------|----------------------------------|
| a) <i>Micropterus salmoides</i> | b) Pomoxis nigromaculatus |
| c) <i>Esox Niger</i> | d) <i>Cyprinus Carpio</i> |
- 8) What is the species in tray #8?
- | | |
|----------------------------|----------------------------------|
| a) <i>Perca flavescens</i> | b) <i>Carcharodon carcharias</i> |
| c) <i>Morone americana</i> | d) Lepomis gibbosus |

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

- 9) What species is the shell #9?
- | | |
|------------------------------|------------------------------|
| a) Anodonta implicata | b) <i>Leptodea ochracea</i> |
| c) <i>Ligumia nasuta</i> | d) <i>Corbicula fluminea</i> |

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

- 10) What is the family in vial # 10?
- | | |
|-----------------------|-------------------------|
| a) Psephenidae | b) <i>Idontknowidae</i> |
| c) <i>Perlidae</i> | d) <i>Pyralidae</i> |
- 11) What is the family in vial #11?
- | | |
|----------------------------|---------------------|
| a) <i>Taeniopterygidae</i> | b) <i>Gomphidae</i> |
| c) Tipulidae | d) <i>Decapoda</i> |

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

12) What is the plant in container #12?

- a) *Egeria densa*
- b) ***Trapa natans***
- c) *Najas minor*
- d) *Ulva lactuca*

For the remaining questions on the exam, no ID guides or other reference materials may be used. All questions come directly from 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.

13) When watering an established lawn at your home, which of the following will prove to be the most beneficial method for your grass? (*Home lawn watering fact sheet pg 2*)

- a) watering via sprinkler or hose to volumes of 1 inch of water per day
- b) **watering via sprinkler only to supplement natural rainfall to a volume of 1 inch per week**
- c) leaving a sprinkler on all day from 9am-5pm, 3 days per week
- d) watering via a soaker hose nightly to volumes greater than 1 inch of water per day

14) Which of the following is NOT an environmental benefit of properly installing a rain garden? (*UCONN Rain Gardens brochure pg 1*)

- a) they help sustain adequate stream flows during dry spells through proper infiltration and recharge
- b) they enhance the beauty of yards and neighborhoods
- c) they reduce the need for costly municipal stormwater treatment structures
- d) **they create breeding grounds for pest insects such as mosquitoes**

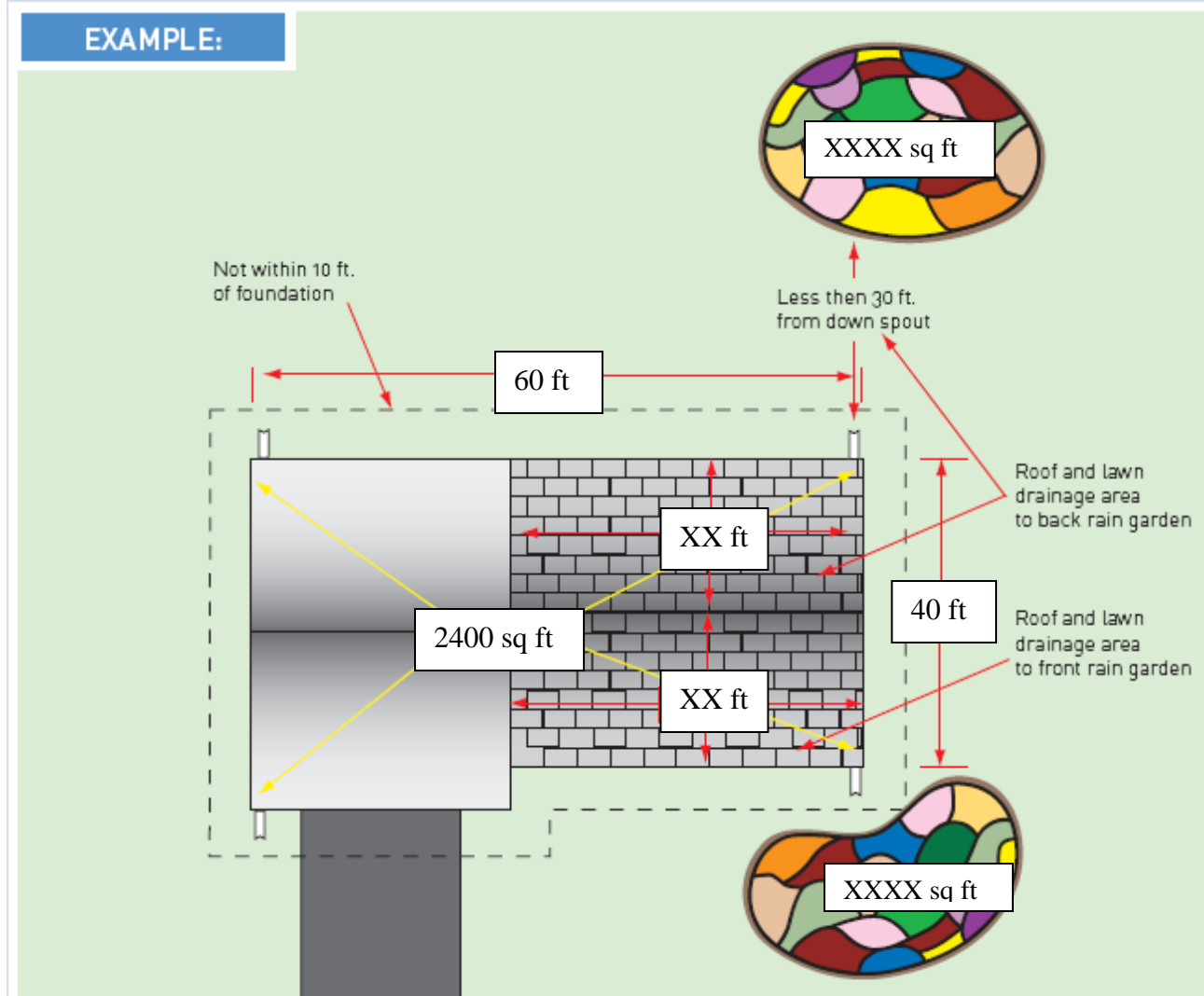
15) When utilizing ARC GIS to estimate the impact land use on drinking water wells, a Zone of Contribution (ZOC) was delineated as a recharge area for the aquifer. This ZOC is similar to a watershed in concept. For the relevant study, what is the definition of a ZOC? (*Historical Reconstruction Using GIS document pg 2*)

- a) **The ground surface area through which precipitation infiltrates, which will eventually be drawn into a pumping groundwater well.**
- b) The land over which sheet flow will run until it reaches a surface waterbody such as a pond or stream.
- c) The surface area of impervious surfaces located within the watershed of a pond or stream.
- d) The ground surface area over which the root mass of an established tree will conduct uptake of groundwater through its root system.

16) Agricultural activities are considered the primary anthropogenic source of nitrogen in aquatic systems (Nolan 2001; Howarth 2004). Elevated NO_3^- levels in streams and wetlands pose ecological problems such as _____. (*Land-use effects on ground water quality paper pg 1*)

- a) **increased growth of aquatic vegetation and eutrophication**
- b) decreased food for filter feeding aquatic invertebrates
- c) toxic effects to wildlife that consume the surface waters
- d) reduced growth of aquatic vegetation and algae

17) To calculate the proper size of a rain garden prior to installation, you must calculate roof area, % of roof drained by each downspout, and then divide the % of roof for each garden by 6. What is the appropriate sized rain garden in the following example? (*UCONN rain garden brochure pg 6*)



- a) 10 sq ft
- b) 100 sq ft**
- c) 1000 sq ft
- d) 350 sq ft

18) When removing aquatic plants from a water garden that is being emptied for the winter, which of the following is an appropriate method for disposal of the plants? (*Invasive Aquatic Plants pg 4*)

- a) Use the plant fragments as pizza topping
- b) **Freeze the plants completely solid and place in household garbage bags**
- c) Dump the plants in the closest waterbody
- d) Dry plants completely and compost

19) A 40-acre pond has been surveyed annually for aquatic plant diversity by a local environmental group. During the survey this year a small 20 ft X 20 ft section of *trapa natans* was discovered in one corner of the pond. Further surveys showed this was the only infestation. What is the most appropriate course of action? (*CAES Invasive plant guide pg 22*)

- a) Spray the entire pond with herbicide multiple times during the summer
- b) Nothing, *trapa natans* is a native plant and should cause no problems
- c) **Conduct a hand pulling of the plants with a group of volunteers**
- d) Introduce grass carp into the pond to consume plants

20) Organisms that undergo a complete metamorphosis have a life cycle consisting of which of the following list of stages? (*River Watch Macro Guide pg 2*)

- a) egg, larva, teenager, adult
- b) egg, pupa, adult, sub-adult
- c) **egg, larva, pupa, adult**
- d) larva, late instar larva, adult

21) The definition of a riffle area is _____? (*River Watch Macro Guide pg 6*)

- a) deep slowly moving waters with sandy substrate
- b) **shallow fast moving waters with relatively diverse substrate**
- c) shallow slow moving waters with uniform sandy substrate
- d) a whirlpool

To answer the next three definitions, please choose the correct term directly from the options listed in the adjacent text box. Not all choices will be used. (*All text is taken from River Watch Macro Guide pg 12*)

22) Shredders feed on large pieces of _____ such as leaves and other plant parts that fall into the river

23) _____ capture and feed on other animals in the river

24) Functional Feeding Groups: groups of organisms that share a common _____ and food source

-sand/gravel	-feeding strategy(24)
-organic matter(22)	-algae
-predators(23)	-collectors
-ancestry	-midges

25) Which of the following is the appropriate methodology to reduce or eliminate the possibility of transporting Didymo from one waterbody to another waterbody? (*Didymo: an Invasive alga*)

- a) keep waders and boots moist in tap water in between usages
- b) **check equipment for clumps of algae and clean with a 2% bleach solution for a 1 min soak**
- c) wipe down all materials and equipment with Swiffer© wipes and allow to dry for 1 hour prior to entrance in a new waterbody
- d) quick dip of all equipment in isopropyl alcohol in between site visits

Complete the following three pathways (ie pollutant, source, negative impact) using only words in the text box, for example: heavy metals, metal roofs, toxicity of water column. (*pg 9 Chapter 2 Urban Stormwater Manual*)

26) Excess nutrients, fertilizers, _____

27) _____, road salting and salt storage, toxicity of water column and sediment

28) Pathogens, _____, contaminated beaches

- **algal growth(26)**
- brake pad dust
- animal waste(28)**
- old toothbrushes
- hydrocarbons
- deicing constituents(27)**

29) Which of the following organisms must NOT be found in a water body for it to be considered a vernal pool? (*pg 4 wicked big puddles excerpt*)

- a) fairy shrimp
- b) American bullfrog
- c) **pumpkinseed**
- d) musk turtle

30) Which pesticide has been linked to the decline of osprey in coastal ecosystems? (*Long Island Sound Study pg.6*)

- a) Dieldrin
- b) Pyrethrin
- c) **DDT**
- d) ATM

31) Introduction of elevated nitrogen levels into Long Island Sound from treated sewage has an impact on local plant populations. Which of the following results is likely to occur from decreased discharge volumes of treated sewage? (*Long Island Sound Study pg.9*)

- a) **eelgrass acreage will increase**
- b) sea lettuce acreage will increase
- c) sea lettuce and eelgrass will both decrease
- d) sea lettuce and eelgrass will both increase

32) Percent impervious cover in a watershed has been linked to diversity of aquatic insects in a waterbody. In numerous studies, a certain percentage of impervious surface corresponded to the initial drop in diversity to a poor level. What is that percentage? (*Article 1 Stormwater Center Articles pg5*)

- a) 0.1%
- b) **12 %**
- c) 50 %
- d) 100 %

33) Headwater streams are small streams that are relatively short in length and drain relatively small watersheds. They do comprise roughly 75% of the total stream and river mileage in the United States. When conducting a stream classification for a regional watershed, which streams are considered “headwater streams”? (*Article 28 Stormwater Center Articles pg 3*)

- a) 9th and 10th order
- b) 5th and 6th order
- c) **1st and 2nd order**
- d) 1st and 10th order

34) Which professional basketball team will LeBron James be playing for at the start of the next

NBA season? _____ **(all answers are worth 1 point)**