CONNECTICUT ENVIROTHON 2012
SOILS QUESTIONS

Please select the best response to the following questions. There are 25 4 point questions. Many have more than one part. Good luck!

Section 1: Judging the soil pits

1. The following sequences of master horizons can be found in Connecticut. Which of these horizon sequences is found is soil **pit 1**? (4 points)
    a. A – B – C
    b. O – A – B – R
    c. O – M – G
    d. O – A – B – C

2. Which of the following textures best describes the B-horizon found in soil **pit 1**?   (4 points)
    a. Sandy
    b. Clayey
    c. Silty
    d. Muck

3. Which of the following textures best describe the B-horizon found in soil **pit 2**?   (4 points)
    a. Sandy
    b. Clayey
    c. Silty
    d. Muck

4. (*2 part*) What is the thickness of the O horizon in soil **pit 1**? (2 points)
    a. 0-3 inches
    b. 4-6 inches
    c. >6 inches
    d. No O horizon present

    What is the thickness of the O horizon in soil **pit 2**? (2 points)
    a. 0-3 inches
    b. 4-6 inches
    c. >6 inches
    d.   No O horizon present

5. What is the parent material that formed of the soils found in **pit 1**? (4 points)
    a. Glacial outwash
    b. Recent alluvium
    c. Marine sediments
    d. Limestone bedrock

6. Name two features in a typical **soil profile** that you would look for to help determine a wetland soil. (4 points for 2 correct, 2 points for 1)

    High water table, redoximorphic features (mottles), grey matrix, thick organic layer, "rotten egg" odor

Section 2: Evaluating the custom soil report

7. What is the **full name** of the soil map unit at **pit 1**? (4 points)

    38C Hinckley gravelly sandy loam, 3 – 15 percent slopes

8. Determine the following factors using the tables contained in the custom soil report for the soil found in soil **pit 1**. (1 point each)

    a. What is this soils erosion hazard?
        Slight

    b. What is the hydrologic soil group?
        A

    c. What is the drainage class?
        Excessively drained

    d. Is this listed as a Connecticut wetland?
        No, not a wetland

9. What is the full name of the soil map unit at **pit 2**? (4 points)

    107 Limerick and Lim Soils

10. Determine the following factors using the tables contained in the custom soil report for the soil found in soil **pit 2**. (1 point each)

    a. What is this soils erosion hazard?
        Very Severe

    b. What is the hydrologic soil group?
        D

    c. What is the drainage class?
        Poorly drained

    d. Is this listed as a Connecticut wetland?
        Yes, CT Wetland

11. Which location (*pit 1 or pit 2*) would be best suited for a LID project that addresses contaminated storm water runoff?

   Pit 1   (2 points)

   Why?

   Not considered a wetland. Has good drainage and low erosion potential. Rated good for infiltration and basins.

   (2 points)

12. Read the typical soil profile in the Map Unit Description for soil **pit 1**. How does the soil in the pit differ from the description? (4 points)
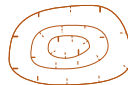
Section 3: Interpreting Maps

   You are provided with aerial imagery and a topographic map of Winding Trails. The location of the soil pits have been identified on the topographic map. Use the maps to answer questions 13 through 16.

13. According to the topographic map, approximately how high in elevation is soil pit 1? (4 points)

   190-200 feet is acceptable

14. What is the legend symbol for the following features? Draw the symbol next to the name. Determine if any of the features be found within 2,000 feet of the soil pit location on the topographic map? (1/2 point each)

   a. Depression, Crater: yes   no

   b. Quarry or Open Pit Mine: yes   no

   c. Wet area: yes   no

   d. Train tracks/Rails: yes   no

15. What is the map scale if 1 inch on the map equals 1,000 feet on the ground? (4 points)
    a. 1 : 2,000
    b. **1 : 12,000**
    c. 1 : 6,000
    d. 1: 1,000

16. Topographic maps do not have a: (4 points)
    a. Legend
    b. North arrow
    c. Scale
    d. **Slope**

Section 4: Soil properties and characteristics

17. Circle the correct answers to the following statements about soil organic matter. (1 pt each)
    a. Soil organic matter decreases the rate of water infiltration into the soil.
        True   **False**

    b. Soil organic matter stores and supplies nutrients.
        True   False

    c. Soil organic matter retains carbon from the atmosphere.
        True   False

    d. Soil organic matter increases the bulk density of the soil.
        True   **False**

18. Students at a local school are converting a section of a vegetable garden into blueberry bushes. The students had UConn Soil testing laboratory do a soil fertility analysis on the garden soil. The lab report indicated that the pH of the soil was 6.5. Blueberries do best in acidic soil (pH of 4 – 5). What is the best way to decrease the pH? (4 points)
   a. Add ground limestone
    b. **Add sulfur**
    c. Add organic matter
    d. You can't decrease the pH of a soil

19. Which of the following events most affected the present day landforms and soils of Connecticut?
    (4 points)
    a. Plate tectonics
    b. Alpine glaciations
    c. The Dust Bowl
    d. **Continental glaciations**

20. Label the missing components of a typical topsoil in the pie chart below: (2 points each)

Water _____
25%

Mineral Matter
45%

A:_____
25%

B:_____
5%

Air   Organic Matter
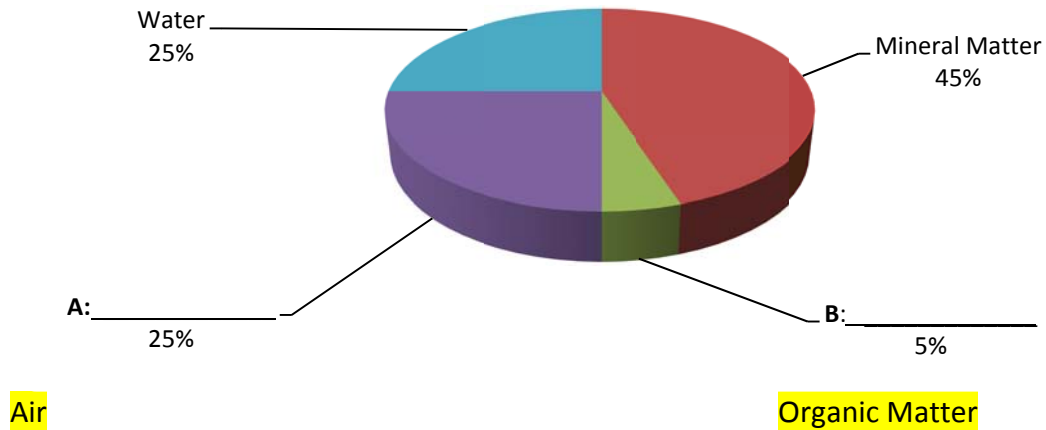
21. Two of the five soil forming factors are time and climate. List two of the three other factors.
Parent material, topography, organisms
(2 points each, max 4 points)

22. (*2 part*) Which of the following is characteristic of a typical soil in an urban area? (2 points)

   a. Good soil structure
   b. High organic matter content
   c. Soil compaction
   d. Lower soil temperature

How would you measure soil compaction in the field?   (2 points)

Penetrometer, bulk density test, wire flag

23. Which of the following may be non-point source pollutants? (4 points)
   a. Manure
   b. Pesticides
   c. Nitrogen
   d. Soil
   e. All of the above

24. A slope of 10% means _____10_____ foot change in elevation in _____100_____ feet on the ground. (4 points for this or another correct answer)

25. How do organisms improve the soil condition? (4 points)
    a. Create pores and increase infiltration
    b. Increase organic matter and nutrient availability
    c. Promote chemical exchange between soil and plant roots
    d. None of the above
    e. All of the above

BONUS QUESTION!!! (2pts)

Consult with your team members about the most interesting thing you learned about soils this year. Tell us what you "dig" about soils. (2 points)

Nearly any true soil characteristic is acceptable.

Current Issue Questions / Soils Station
2 points each

1. Which of these actions might improve the effectiveness a compacted soil for a storm water runoff retrofit?
   a) Aeration
   b) Tree planting
   c) Adding organic matter
   d) All of the above
   e) None of the above

2. Which soil property is **least** important when selecting and designing LID practices.
   a) Texture
   b) Slope
   c) pH
   d) Organic matter amount

3. A very loose sandy soil with naturally high infiltration rates can become poor soils for infiltration due to land use and management.
   True   False

4. You are designing a rain garden. When you examine the soil you find that it is very clayey. You should make the garden 50% smaller / larger (circle one)

5. A soil's drainage class doesn't affect the placement and design of a rain garden.
   True   False