

## **Soils Station: 2017 Area IV Envirothon**

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### **On-site Questions:**

1. Much of the waste that was produced during deconstruction of the Fernald Feed Materials Production Center has been buried here on site. Several layers of synthetic and natural materials were used to protect groundwater from being contaminated by this waste. Which soil texture class would provide the best barrier to waste water infiltration?
  - a. Silt loam
  - b. Loamy sand
  - c. Clay
  - d. Clay loam
  
2. The surface horizon of a soil is commonly called “top soil”. Much of the plant root growth occurs in this top layer because it holds the most nutrients and available water for plants. What is the top soil depth of Soil Profile A, EIA?
  - a. 18 in.
  - b. 9 in.
  - c. 2 in.
  - d. 24 in.
  
3. What is the texture of the soil in Bucket 2?
  - a. Loam
  - b. Sandy loam
  - c. Clay
  - d. Silty clay
  
4. The root restrictive layer in a soil is the depth at which roots can no longer penetrate deeper into the profile. This is due to dense material that lacks the pore space needed for root growth. At what depth do you expect the root restrictive layer to start in Soil Profile B, XeB?
  - a. 8 in.
  - b. 24 in.
  - c. 15 in.
  - d. 43 in.
  
5. Organic matter consists of dead and decaying plant material that adheres to soil particles, and can stain particles causing them to appear darker than normal. It is an important component to mineral soils because it has high water and nutrient holding capacity. Which soil profile would you expect to have the highest percent of organic matter in the top layer based solely on color?
  - a. EIA
  - b. RtB
  - c. UpA
  - d. XeA
  
6. The Urban Land Patton Complex (UpA) is often used to map soil in urban or suburban settings that have significant disturbance from development. Judging from the UpA profile, what indicator would you use to determine that this soil has been disturbed?
  - a. The subsoil (B horizon) is below 15 in.
  - b. There is a mixed BC horizon
  - c. There is 7 in. of fill material over the original top soil
  - d. There is till material below 36 in.

7. Parent material in soil is the unconsolidated, relatively unweathered minerals and organic matter from which soil develops. In many Ohio soils, the parent material is glacial till consisting of large pieces of limestone. At what depth do you find large concentrations of parent material in the Russell (RtB) profile?
  - a. 6 in.
  - b. 24 in.
  - c. 12 in.
  - d. 42 in.
  
8. A mixed horizon is a layer in the soil that contains material from both the upper and lower layers but is not its own distinct layer. At what depth does the mixed horizon of the A horizon and the B horizon start in the EIA profile?
  - a. 3 in.
  - b. 9 in.
  - c. 20 in.
  - d. 15 in.
  
9. What is the soil structure of the soil in Bucket 1?
  - a. Single Grain
  - b. Subangular blocky
  - c. Fine Granular
  - d. Massive

**General Questions:**

10. Soil Fertility is a measure of the level of essential plant nutrients that are available in a given soil sample. What are the three most common macronutrients measured in soil?
  - a. Nitrogen, Calcium, Sulfur
  - b. Nitrogen, Phosphorus, Potassium
  - c. Potassium, Magnesium, Phosphorus
  - d. Calcium, Phosphorus, Nitrogen
  
11. Soils information can be found in many places. What resource should be used to get the most up-to-date soils data?
  - a. County soil survey books
  - b. Soil survey CDs
  - c. NRCS's Web Soil Survey
  - d. Facebook
  
12. What are the 5 Soil Forming Factors?
  - a. Time, Climate, Relief, Parent Material, Living Organisms
  - b. Time, Climate, Relief, Rainfall, Tillage
  - c. Time, Climate, Relief, Organic Matter, Slope
  - d. Time, Climate, Relief, Rainfall, Living Organisms
  
13. Topsoil is vitally important to plant growth because it contains the majority of available nutrients and water that plants need. In Ohio's temperate climate, how long does it take to form 1 inch of topsoil?
  - a. 1000 years
  - b. 24 months
  - c. 500 years
  - d. 10,000 days

14. Wetland soils, or hydric soils, are an important part of determining if a site is suitable for wetland restoration. Soil scientists use hydric soil indicators such as color and natural drainage class to determine if a soil is hydric. Which natural drainage class would you expect to have the best chance for a successful wetland restoration?
- Excessively drained
  - Somewhat poorly drained
  - Very poorly drained
  - Moderately well drained
15. One of the common parent materials found in Ohio is Loess. What phrase best describes Loess?
- Material that has moved from upslope
  - Windblown silt material
  - Material that weathered in place
  - Water deposited material
16. The structure of soil determines how fast water and air will move through the soil system. What is the definition of soil structure?
- The relative amounts of sand, silt and clay
  - The amount of water available to plants in the soil
  - The point at which soil goes from a solid to a liquid
  - The arrangement of soil particles into units called aggregates
17. Much of Ohio has been used for row crop agriculture for over 100 years. Due to early farming practices that turned the soil over each season, our soils have experienced a large loss of \_\_\_\_\_?
- Organic matter
  - Sand
  - Earthworms
  - Heat

### **Soil Survey Packet Questions**

18. A map unit symbol represents an area on the map that is dominated by one or more major kinds of soil, or map unit name. The letters represent the name and slope of the map unit. What does the letter "F" represent in the map unit symbol "HeF"?
- Severely eroded
  - Fine silt loam
  - 35 to 60 percent slope
  - Fincastle silt loam
19. Land capability classification is a value given to each soil map unit that tells planners what limitations a soil has for growing crops. What is the land capability classification (nonirrigated) for MaB – Markland silty clay loam, 2 to 6 percent slopes?
- 2w
  - 7e
  - None specified
  - 3e

20. With the advent of Global Information Systems (GIS), soils information can be viewed at a variety of different scales. However, soil maps were intended to be viewed at a specific scale because of the accuracy they were mapped. What is the correct scale for the soil map in your packet?
- 1:15,800
  - 1:43,000
  - 1:50,000
  - 1:3,000
21. A typical profile is given for each map unit in a soil profile. This gives planners an idea of what will be present in the field at the location of the map unit. What is the texture in the Ap horizon of a typical Fincastle profile?
- Clay loam
  - Silt loam
  - Clay
  - Sandy loam
22. Because of the large scale of soil surveys, soil map units are comprised of a major soil component and several minor components that share similar properties. Which minor component is **not** present in the Hennepin silt loam map unit?
- Miamian
  - Eden
  - Xenia
  - All of the above
23. Landform categories are used to describe what type of geological formation in which the soil developed. According to the map unit description, in what landform setting would you find Fincastle silt loam?
- Alluvium
  - End Moraine
  - Till Plain
  - Outwash
24. Many Ohio soils are not suited to building homes with basements because of high water tables. Based on the “depth to water table”, which soil would be best suited to building a house with a basement?
- FdA
  - McA
  - MaB
  - XeA
25. Ponding is a common limitation for many Ohio soils because of their high clay content and it is quantified by the frequency rated from frequent to none. What is the ponding frequency of the Martinsville silt loam (McA)?
- None
  - Rare
  - Occasional
  - Frequent