

**2010 Area 1 Envirothon
Shelby/Mansfield KOA, Crawford County, Ohio**

Soils

Do not write answers on this paper.

- o *Indicate the one best answer for each question on the “Soils” Scantron answer card.*
- o *Use a No. 2 pencil*
- o *Erase completely to change*

Use the tables provided to answer questions 1 – 13

1. The Envirothon Soil Pit Site is located on the edge of a Soil Map Unit that has “CdB2” for the Map Symbol. According to “The Map Unit Legend Table”, what Soil does the Symbol, CdB2 represent?
 - A. Cardington silt loam, 2 to 6 percent slopes
 - B. Cardington silt loam, 2 to 6 percent slopes, moderately eroded
 - C. Cardington silt loam, 6 to 12 percent slopes
 - D. Cardington silt loam, 6 to 12 percent slopes, moderately eroded

2. The depressional land forms that serve as ground water recharge areas often contain “Hydric” Soils (Soils that formed under wetland conditions). Map Units can contain other soils (components). According to the “Hydric Soils Table” what hydric soil components are likely to occur on drainageways in the “CdB2” Soil Map Unit?
 - A. Colwood and Olmsted
 - B. Bono and Olmsted
 - C. Marengo and Pewamo
 - D. Holly and Pewamo

3. According to the “Hydric Soils Table”, what could be the **TOTAL** percent of hydric soil components that are likely to occur on drainageways in the “CdB2” Soil Map Unit?
 - A. 2 percent
 - B. 4 percent
 - C. 6 percent
 - D. 8 percent

4. According to “The Acreage and Proportionate Extent of the Soils by County Table” how many acres of Crawford County is considered the “CdB2” Soil Map Unit?
 - A. 6,962
 - B. 10,167
 - C. 10,779
 - D. 60,031

5. Ground water models that predict the quantity and quality of water often consider the properties of the specific soils in the study area. According to “The Acreage and Proportionate Extent of the Soils by County Table,” what Soil Map Unit covers the most acres of Crawford County?
 - A. AdB
 - B. BgB
 - C. CdB2
 - D. Cr

6. Ground Water Protection Plans often include Nutrient Management Plans for Agricultural Lands above the targeted Aquifer. Some crops require a specific “Soil Reaction” or “pH” of the soil to efficiently uptake nutrients applied by the farmer. According to “The Chemical Soil Properties Table” what depth in the “CdB2” Soil Map Unit would a plant need to grow its roots to find a Soil pH range of 7.4-8.4?
- A. 0-2 inches
 - B. 2-12 inches
 - C. 10-42 inches
 - D. 42-68 inches
7. The amount of nutrients that a soil can hold for crop use is measured by its Cation Exchange Capacity (CEC). According to “The Chemical Soil Properties Table” what is the range of CEC for the “CdB2” Soil Map Unit at the 10-42 inch depth?
- A. 9-20 meq/100g
 - B. 12-18 meq/100g
 - C. 18-24 meq/100g
 - D. 22-38 meq/100g
8. Organic Matter is one of the most reactive portions of the soil in ability to store and release nutrients. According to “The Physical Soil Properties Table” what is the range of Percent Organic Matter for the “CdB2” Soil Map Unit at the 0-10 inch depth?
- A. 0.0-1.0
 - B. 1.0-3.0
 - C. 3.0-7.0
 - D. 5.0-9.0
9. Soil Erosion reduces the ability of the soil to store nutrients. The erodibility of a soil horizon by water is measured the “Kw” value assigned to it. According to “The Physical Soil Properties Table” what is the Kw value for the “CdB2” Soil Map Unit at the 0-10 inch depth?
- A. .24
 - B. .28
 - C. .37
 - D. .43
10. Saturated Hydraulic Conductivity is a measurement of the ability of water to move thru a specific soil layer. These measurements are helpful in estimating Ground Water Recharge. According to “The Physical Soil Properties Table” what is the range of Saturated Hydraulic Conductivity for the 10-42 inch layer of the “CdB2” Soil Map Unit?
- A. 0.42-1.41 micro m/sec
 - B. 1.41-4.23 micro m/sec
 - C. 4.23-14.11 micro m/sec
 - D. 14.11-42.34micro m/sec
11. Ponding of water on the surface of the soil is one of nature’s ways to recharge ground water. According to the “Water Features Table” what months of the year would you expect ponding to occur on the “Cr” Soil Map Unit north of the Envirothon Soil Pit?
- A. November-December
 - B. November-March
 - C. November-May
 - D. November-July

12. Flooding of Surface Water across a Flood Plain can also spread the water out and slows it down so that it can better infiltrate the soil to recharge Ground Water. According to the “Water Features Table” what months of the year would you expect flooding to occur on the “Sh” Soil Map Unit that parallels the creek diagonally thru the Campground at the Envirothon Site?

- A. October-December
- B. October-March
- C. October-June
- D. October-August

13. Hydrologic Group (A-D) classifies a soil’s potential to cause the runoff of surface water during a storm event, where A is the lowest runoff and D is the highest runoff. The higher the runoff the less chance the water has to infiltrate and recharge the Ground Water. According to the “Water Features Table” which Soil Map Unit has the highest runoff potential?

- A. CdB2
- B. CnB
- C. GwB2
- D. OtC2

14. One of the best ways to protect groundwater from nutrient contamination is to tie up the nutrients in plant growth. And one of the most important soil characteristics affecting plant growth is the rooting zone of the topsoil. What is the depth of topsoil in the soil pit?

- A. 2 inches
- B. 4 inches
- C. 8 inches
- D. 16 inches

15. The structure of the soil directly affects the ability of a plant to distribute “feeder roots” evenly throughout the soil. What is the structure of the topsoil (A horizon)?

- A. Columnar
- B. Granular
- C. Platy
- D. Sub Angular Blocky

16. What is the structure of the subsoil at a depth of 18” in the soil pit?

- A. Columnar
- B. Granular
- C. Platy
- D. Sub Angular Blocky

17. The texture of the soil affects the ability of a soil to hold and release nutrients and water for plant growth. What is the texture of the topsoil?

- A. Loam
- B. Silt loam
- C. Sandy loam
- D. Silty clay

18. What is the texture of the subsoil at 18" of depth in the soil pit?
- Loam
 - Silty clay loam
 - Clay
 - Clay loam
19. "Limiting Soil Layers" Limit the downward movement of water due to the type of structure, texture, bulk density or parent material of the soil. As a result, water will move laterally over the top of limiting layer. What type of parent material did this soil form in?
- Alluvial Deposits
 - Aeolian Deposits
 - Glacial Till
 - Lacustrine Till
20. There are "patches" or "spots" of a white mineral in the soil at 18 inches to 24 inches in depth from the top of soil pit. What is this mineral?
- Calcium Carbonate
 - Calcium Chloride
 - Calcium Phosphate
 - Calcium Sulfate
21. What would be the best estimate of pH for the soil layer with the white mineral at 18 inches to 24 inches in depth from the top of soil pit?
- 2.0
 - 4.0
 - 6.0
 - 8.0
22. Ground Water Recharge Zones are usually depressional land forms where water accumulates, ponds and percolates in to the soil. Which Answer best describes the land form at the Envirothon Soil Pit?
- Fan/Escarpment
 - Hill/Side Slope
 - Depression/Flat
 - Beach ridge/Fan skirt
23. Land Use can have a huge effect on the quality of the ground water. What answer best describes the land use where the Envirothon Soil Pit is located?
- Cropland
 - Forestland
 - Pastureland
 - Urban land
24. What Agencies provide Soil Survey Information?
- Ohio Cooperative Extension Service
 - Ohio Department of Natural Resources
 - U.S.D.A. Natural Resources Conservation Service
 - All of the Above

25. Soil Survey Information can be provided in a variety of formats. Which format would contain the most current and up to date information?
- A. Soil Survey Books
 - B. The NRCS Websites, “Soil Data Mart” and “Web Soil Survey”
 - C. Soil Survey CD’s
 - D. Soil Survey DVD’s
26. Ohio Soil Scientists provide On-Site Soil Investigations thru the Federal and State Governments, Universities and Private Consulting Practices. Many of these Soil Scientists belong to a Professional Association in Ohio to promote the wise use of our soil resources and provide continuing education credits to its’ members and others. What is the name of this Association?
- A. The Association of Ohio Pedologists (AOP)
 - B. The Association of Ohio Soil Classifiers (OSC)
 - C. The Association of Ohio Soil Inspectors (AOSIS)
 - D. The Association of Ohio Geologists (AOG)
27. Certain tree species are adapted to grow best on a certain drainage class of soil. Select the drainage class of soil that Black Walnuts grow best on.
- A. Well Drained
 - B. Moderately Well Drained
 - C. Somewhat Poorly Drained
 - D. Poorly Drained
28. Specific plants have adapted to grow on specific soils. Which species of oak tree will grow best on a Very Poorly Drained Soil, where Ground Water is near the Soil Surface?
- A. White Oak
 - B. Red Oak
 - C. Pin Oak
 - D. Scarlet Oak
29. Certain plants have adapted to grow on soils with specific depths to Ground Water. Which species of Prairie Grass will grow best on a Very Poorly Drained Soil, where the Ground Water is close to the Soil Surface?
- A. Big Bluestem
 - B. Little Bluestem
 - C. Indian Grass
 - D. Switch Grass
30. Certain plants have adapted to grow on soils with specific depths to Ground Water. Which species of Prairie Grass will grow best on a Well Drained Soil where the Ground Water is deep from the Soil Surface?
- A. Big Bluestem
 - B. Little Bluestem
 - C. Indian Grass
 - D. Switch Grass

31. Wetlands are locations where a Water Table is near or above the Soil Surface for periods during the growing season. What Functions do Wetlands provide?
- A. Filter and process nutrients and toxins
 - B. Recharge Ground Water
 - C. Store Surface Water Run Off from adjacent upland areas
 - D. All of the Above
32. The biggest threat to wetlands in NW Ohio is:
- A. Desertification
 - B. Erosion
 - C. Drainage
 - D. Sun Spots
33. Unplanned Urban Development (Houses, buildings, streets, roads, malls and parking lots) can be a threat to Ground Water. The KOA Camp Ground is built with "Sh" Shoals Soils going diagonally right thru the center of the Camp Ground along the Creek. What is the most severe soil limitation in this area?
- A. Slope
 - B. Flooding
 - C. Slippage
 - D. Wind Erosion
34. A Camp Ground can receive large numbers of people concentrated in a very small area. What is the greatest financial challenge for a rural isolated development like this KOA Camp Ground that could pollute the Ground Water?
- A. Access Roads
 - B. Electric Lines
 - C. Sewage Disposal
 - D. Telephone Lines

Answers

1. B
2. C
3. D
4. C
5. B
6. D
7. C
8. B
9. C
10. B
11. D
12. C
13. C
14. C
15. B
16. D
17. B
18. B
19. C
20. A
21. D
22. B
23. A
24. D
25. B
26. A
27. A
28. C
29. D
30. B
31. D
32. C
33. B
34. C