

2009 Wisconsin Envirothon **KEY**

Soil Resources Exam

Answers that are correct but differ strongly from answer key must be initialized by Station Captain as an approved answer prior to delivery to score stewards.

Use the Langlade County Soil Survey for the following four questions.

1. What is the permeability of the Magnor Soil Series?
(2 pts, 1 pt each)

Upper part: Moderate Lower Part: Moderately slow

2. What is the slope range for the Vilas loamy sand (VsB) map unit? (3 pts)

0 to 6 percent slopes

3. You are looking for a soil located in Section 27, Township 33 North, and Range 14 East. What is the number of the Soil Survey sheet you will use? (3 pts)

27

4. What is the degree (or rating) and type of limitation (or reason) for a septic tank adsorption field for a Pence Sandy Loam (PsB) map unit? (2 pts)

Degree: Severe Limitation: Poor filter

The following questions are general knowledge questions.

5. In general pH values between 6.5 and 7.5 are optimum for root growth
(3 pts, 1.5 pts each)

6. Sand, silt and clay content is estimated in the field and placed within the textural triangle to determine Texture Class. (3 pts)

7. Which of the following is most likely to influence the development of soil structure in the B horizon? (2 pts)
- a. Air quality above the soil.
 - b. Animals grazing on the land.
 - c. The number of freezing and thawing cycles.
 - d. The type of tillage implements used by farmers.
8. What soil is more likely to have more organic matter in the A horizon? (3 pts)
- a. A soil formed in a desert area
 - b. A soil formed in a forest area
 - c. A soil formed in a mountainous area
 - d. A soil formed in a prairie area
9. Which of the three soil particle sizes that make up soil texture has the least nutrient holding capacity? (3 pts)

Sand

10. What are two significant effects of slope aspect on a soil? (4 pts, 2 pts each)

Possible answers include: Effect on soil temp, effect on soil development, permeability, infiltration, effect on soil ph by influence of plant communities that may or may not grow, effect on erosion, and effect on soil moisture.

11. Soil aggregates consist of several soil particles bound together. (3 pts)

12. What is a benefit of soil organism activity? (3 pts)

- a. Decrease soil pH, which helps to reduce runoff and soil erosion.
- b. Improve the infiltration and storage of water.
- c. Increase plant residue.
- d. Large organisms feed on the by-products of small organisms.

13. Does tilling the soil to greater depths and with more frequent cultivations have a negative or positive impact on soil organisms? (3 pts)

Negative

14. What effect does soil compaction have on the following items? (4 pts)

Check the correct box for each lettered item

	Increase	Decrease	No Effect
a. Infiltration		X	
b. Runoff	X		
c. Soil Texture			X
d. Tree Growth		X	

15. The amount of organic matter in a soil is important. What two climatic factors have a dominate influence in the amount of organic matter in the soil? (4 pts, 2 pts each)

Temperature and rainfall

16. What type of parent material is deposited by flowing water and typically lies in a floodplain? (3 pts)

Alluvium

17. A small building is being built in Wisconsin on a site with four soil types. What soils should be avoided? (3 pts)

- a. clay soils
- b. loamy soils
- c. organic or muck soils
- d. sandy soils

18. What three criteria are necessary to identify a wetland? (3 pts)

Wetland or hydric soil; wetland vegetation; wetland hydrology

19. The horizon where illuvial clay accumulates is known as what? (3 pts)

- a. Bg horizon
- b. Bs horizon
- c. Bt horizon
- d. Cg horizon

20. What is the percent slope of a field that has a change in elevation of 47 feet and is 420 feet long? (3 pts)

% slope = 11 (round to nearest whole number)

21. What is the term used for parent material that was moved and deposited by glaciers and typically lies on the upland? (3 pts)

Glacial till

22. What five major factors determine how soils develop? (10 pts, 2 pts each)

- a. time
- b. climate
- c. organisms
- d. parent material
- e. topography or landscape position or relief

Use the samples in the containers to answer the next series of questions.

23. What is the soil texture in container 1? (3 pts)

- a. clay
- b. sand
- c. silt

24. What is the soil texture in container 2? (3 pts)

- a. clay
- b. sand
- c. silt

25. What is the soil structure in container 3? (3 pts)

- a. Massive
- b. Platy
- c. Prismatic
- d. Sub-angular blocky

Visit the soil pit to answer the following questions. (Answers will be provided on day of exam)

26. What is the structure of the horizon marked in the soil pit? (3 pts)

- a. Loose
- b. Massive
- c. Prismatic
- d. Sub-angular blocky

27. Which of the following best describes this soil's natural soil drainage class? (3 pts)

- a. Moderately well drained
- b. Poorly drained
- c. Somewhat poorly drained
- d. Well drained

28. What is the moist color of the horizon labeled "I"? (3 pts) 10YR 4/4 or 7.5YR 4/4



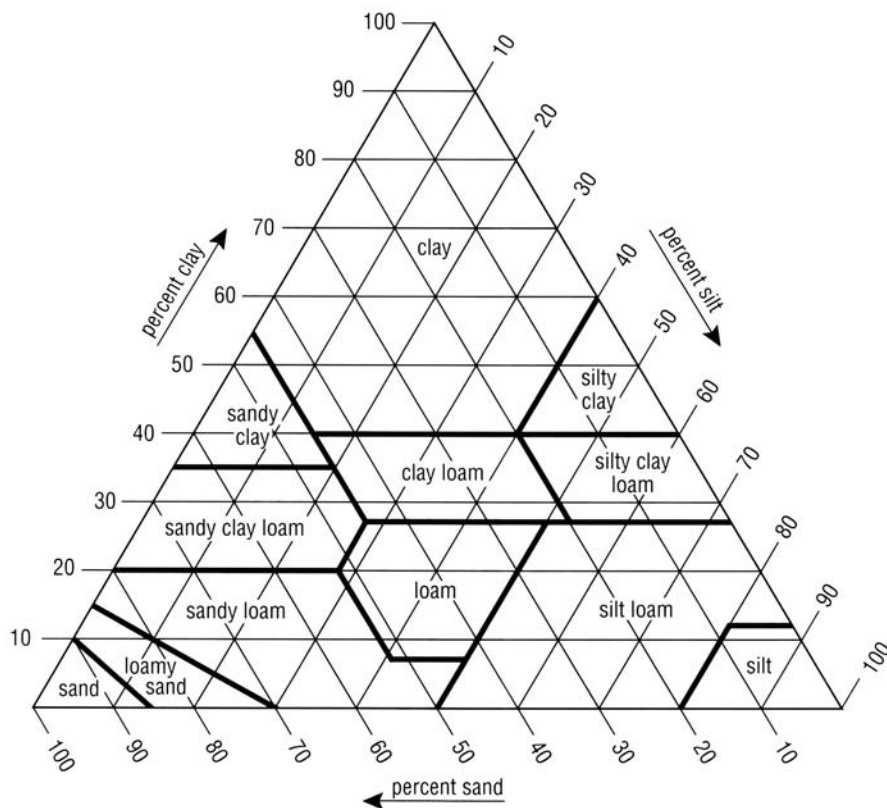
29. What is the thickness of the A horizon? (3 pts) 12, 13 or 14 inches

30. Using the texture triangle, identify the texture of the three soils based on their relative proportions of sand, silt, and clay. (6 pts)

a. 40% sand, 23% silt, and 37% clay Clay loam

b. 5% sand, 45% silt, and 50% clay Silty clay

c. 85% sand, 5% silt, and 10% clay Loamy sand



Tie Breaker:

What surface soil property is most closely linked to soil color?

Organic matter or soil organic matter or the amount of organic matter