



**PA State ENR CDE: Soil Component
100 Individual Points**



Directions: Multiple Choice - Each Question is worth 5 pts. **Place your answers on the Answer Sheet.** Hand in both the Exam and the Answer Sheet when finished.

1. Calculate the % silt in a soil with a sample weight of 50 g with a 40 second reading of 28 grams of sand and a two hour reading of 14 grams of clay.
 - a. 16%
 - B. 8%
 - C. 56%
 - D. 28%

For Questions 2-4, determine the type of soil using the soil triangle below:

2. 50% Sand, 40% Silt, 10% Clay
 - a. Clay Loam
 - b. Loam
 - c. Sandy Loam
 - d. Silt Loam
3. 20% Sand, 20% silt, 60% Clay
 - a. Silt Loam
 - b. Silty Clay
 - c. Clay
 - d. Clay Loam
4. 20% silt, 10% clay, 70% sand
 - a. Silt Loam
 - b. Loam
 - c. Sandy Clay Loam
 - d. Sandy Loam



Fig 1. USDA Soil Texture Triangle.

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5. As an agronomist a farmer has asked you to evaluate a field to know what texture it is. You get a sample of soil and complete the ribbon test by pressing it between thumb and forefinger and it is grainy and does not make a ribbon. What would be your evaluation?
 - a. It is high in clay
 - b. It is a silt clay loam
 - c. It is a coarse sandy loam
 - d. It will work for building a pond

6. Soil "A" has 45% clay, 45% silt, and 10% sand. Soil "B" has 10% clay, 30% silt, and 60% sand. Comparing the 2 soils, Soil "A" will:
 - a. suffer from dry weather first
 - b. not be good for crops
 - c. have a grainy texture
 - d. hold moisture longer

7. Using a plow to destroy weeds is an example of which type of mechanical control method?
 - a. Exclusion
 - b. Trapping
 - c. Cultivation
 - d. Irrigation

8. Which practice would help prevent groundwater or surface water contamination?
 - a. Eliminate grass strips that are between treated fields and streams.
 - b. Store and mix herbicides around abandoned wells.
 - c. Select pesticides that tightly adsorb to soil and are not persistent.
 - d. Apply pesticides broadly over large areas.

9. Soil tests will at times indicate that nutrients should be "top dressed." What does that mean?
 - a. All nutrients added should be applied via aerial application
 - b. All nutrients should be applied in liquid version
 - c. All nutrients should be applied by incorporating into the soil
 - d. All nutrients should be applied with equipment that would scatter them evenly across the vegetation or field.

For Questions 10-11: You are a farmer looking to ensure your fields have the proper soil conditions for your crops this upcoming season. You have two fields you wish to fix to improve the pH conditions. Use Table 3, provided by OSU Extension, to answer the questions.

10. Your 50 acre field has a pH of 4.8 shown from sent in soil tests. For optimal growth, you want to raise the pH to 6.0. Use Table 3 below to determine the amount of lime needed per acre, then calculate to find the total amount for your field
 - a. 73.1 tons
 - b. 224.1 tons
 - c. 415.0 tons
 - d. 394.5 tons

11. Your 25 acre field has a pH of 5.6 shown from sent in tests. For optimal growth, you want to raise the pH to 6.4. He has a 7 inch tillage depth. Use Table 3 below to determine the amount of lime needed per acre, then calculate to find the total amount for your field
 - a. 32.0 tons
 - b. 157.5 tons
 - c. 664.7 tons
 - d. 220.5 tons

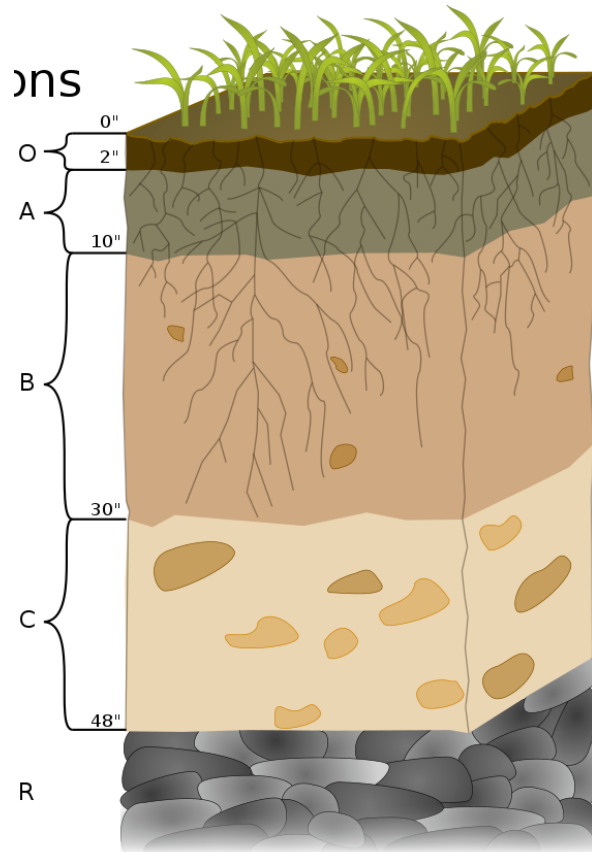
Table 3.—Lime requirement test (SMP) interpretation.

Lime requirement test value (SMP)	Desired soil pH		
	pH 5.6	pH 6.0	pH 6.4
	Lime to apply to attain desired soil pH ^a (t/a)		
6.7	0	0	0
6.6	0	0	1.0
6.5	0	1.0	1.7
6.4	0	1.1	2.2
6.3	0	1.5	2.7
6.2	1.0	2.0	3.2
6.1	1.4	2.4	3.7
6.0	1.7	2.9	4.2
5.9	2.1	3.3	4.7
5.8	2.5	3.7	5.3
5.7	2.8	4.2	5.8
5.6	3.2	4.6	6.3
5.5	3.6	5.1	6.8
5.4	3.9	5.5	7.3
5.3	4.3	6.0	7.8
5.2	4.7	6.4	8.3
5.1	5.0	6.9	8.9
5.0	5.4	7.3	9.4
4.9	5.8	7.7	9.9
4.8	6.2	8.3	10.4

12. What factor does not directly impact groundwater flow?
 a. Pressure b. Porosity c. Water pH d. Permeability
13. When evaluating the land for use, which land capability class would not be suitable for cultivation?
 a. Class I b. Class VI c. Class II d. Class IV
14. Which soil would be the most likely to resist erosion by water?
 a. Sandy Loam B. Clay C. Loam D. Silt Loam
15. The soil consists of four major components i.e., mineral, organic matter, soil air and soil water. In an ideal soil, which component makes up the largest portion?
 a. A. air B. water C. mineral D. organic matter
16. Soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile” is a definition of a(n):
 a. Catena b. Species c. Series D. Toposequence

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17. A soil profile is made up of horizons. Using the image below, there are 4 horizons. What is the name of the major horizon A?
- a. Subsoil B. Subsurface C. Topsoil D. Substratum
18. Using the image below, how deep is the Subsoil for this soil profile?
- a. 2 inches B. 10 inches c. 30 inches D. 48 inches
19. The letter R is used in some soil profile descriptions. What does the R stand for?
- a. Rock Layer B. Restriction layer C. Residuum D. Volcanic ash layer



20. Calculate the following values related to slope. Over a distance (or run) of 160 feet, Stake A at the top of the hill measures a height of 7ft 8in, and stake B at the bottom of the hill measures 2ft 2in. What is the percent slope of this site (to the nearest 0.00%)?
- a. 5.5% b. 0.03% c. 2.02% d. 3.44%