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# CHAPTER 1

## The Soils Around Us

### Multiple Choice Questions

(Circle the single best answer for each question.)

- Most of the different nutrients essential for growth are supplied to plants directly from the \_\_\_\_\_.  
A. rain water      B. soil solution      C. atmosphere  
D. cosmic radiation      E. humus
- In a load of 10 cubic meters of topsoil, approximately how many cubic meters of the volume would be solid material?  
A. 1    B. 2.5    C. 4    D. 5    E. 7.5
- Which of the following is (are) essential plant nutrients?  
A. Cu    B. Al    C. Sr    D. Pb    E. all of the above
- Which of the following is considered to be a plant macronutrient?  
A. N    B. P    C. S    D. Ca    E. all of the above
- Soil occupies the \_\_\_\_\_ part of the regolith.  
A. upper    B. lower    C. younger    D. both B and C
- The lithosphere is made up of \_\_\_\_\_.  
A. air      B. rock      C. water  
D. plants and animals      E. all of the above
- The layers of contrasting material found when one digs a hole in the ground are called \_\_\_\_\_.  
A. pseudoliths    B. regoliths    C. pedons  
D. horizons      E. soil structure
- A soil profile consists of \_\_\_\_\_.  
A. the sum of chemical and physical data known about a soil  
B. the way a soil "feels"  
C. the spatial boundaries of a particular soil  
D. the set of layers seen in a vertical cross section of a soil  
E. the general outline of a soil or group of soils when viewed from the side
- "Topsoil" is generally equivalent to which soil horizon?  
A. A    B. B    C. C    D. D    E. E
- "Subsoil" is generally equivalent to which soil horizon?  
A. A    B. B    C. C    D. D    E. E
- In a typical mineral soil in optimal condition for plant growth, approximately what percentage of the pore space would be filled with water and what percentage filled with air?  
A. 10% water and 90% air      B. 90% water and 10% air  
C. 25% water and 25% air      D. 50% water and 50% air  
E. 25% water and 75% air

12. The amount of different sizes of mineral particles in a soil defines the soil \_\_\_\_\_.  
A. structure      B. texture      C. pore space  
D. solution      E. profile
13. The water in the soil typically differs from pure water because the soil water \_\_\_\_\_.  
A. contains organic compounds  
B. contains mineral nutrients  
C. is restrained in its flow by attraction to particle surfaces  
D. all of the above  
E. none of the above
14. Compared to silt, clay-sized soil particles are characterized by \_\_\_\_\_.  
A. greater attraction for water  
B. greater proportion of primary minerals  
C. less tendency to form hard clods when dry  
D. less capacity to hold nutrients in plant-available forms
15. Which of the following pH values represents a neutral condition?  
A. 1.0 B. 5.0 C. 6.0    D. 7.0    E. 10
16. Which of the following pH values represents the most acid condition?  
A. 1.0 B. 10.0    C. 7.0 D. 100    E. 5.55
17. Most (usually 80% or more) of soil potassium and calcium can be found in the form of \_\_\_\_\_.  
A. dissolved substances  
B. structural components of minerals  
C. exchangeable ions  
D. organic compounds
18. Increasing the organic matter content of a soil is likely to \_\_\_\_\_.  
A. have no effect on water holding capacity  
B. increase the soil's water holding capacity  
C. decrease the soil's water holding capacity
19. Hydroxyl ion concentrations are greatest in a soil solution with a pH value of \_\_\_\_\_.  
A. 0.1      B. 4.0      C. 5.0      D. 6.5
20. In a given soil, the horizon with the highest organic matter content is generally the \_\_\_\_\_ horizon.  
A. E    B. C    C. D    D. B    E. A
21. Information about conditions at 2 to 4 meters deep in a soil is usually most helpful for understanding \_\_\_\_\_.  
A. how best to design a building foundation  
B. the diversity of animal life in the soil.  
C. the proper classification of the soil.  
D. fertility requirements of most crops

**True or False Questions**  
(Write T or F after each question.)

22. Except for some kinds of foods, modern industry has made human dependence on soils a thing of the past.
23. Most of the water in our rivers and lakes has come in contact with and has been affected by soils.
24. Soil air usually has a higher carbon dioxide content than the air in the atmosphere.
25. Plants can be grown without any soil.
26. Hydroponics will likely be a key element in enabling the world to feed and clothe its increasing human population in the next few decades.
27. Practices that tend to increase the amount of organic matter in soils would be expected to reduce the global greenhouse effect.
28. Soil, like concrete and steel, is a standard construction material. Its properties are well characterized and predictable so that standard building foundation designs can be used uniformly at all building sites of a given topography.
29. Although subsoil is more difficult to obtain, it is generally equally as good as topsoil for landscaping purposes.
30. Subsoil is typically equivalent to the O horizon.
31. The mineral particles in soil consist of sand, silt, and clay.
32. Where organic matter constitutes only 1 or 2 percent of the soil by weight, it has only negligible influence on soil properties.
33. The dark brown and black humus found in many soils does not mix well with clay minerals so there is very little contact between these two soil components.
34. Soil horizons, like alluvial sediments, generally have a horizontal orientation, regardless of the slope of the land.
35. A, B, C, and E horizons can be found in any true soil.
36. For any soil in which it is present, the C horizon is the parent material for the B horizon.
37. While many organisms depend on the soil for nutrients and water, only a few very specialized organisms live in the soil itself.
38. If supplied with a suitable nutrient solution, plants can grow normally without any soil at all.
39. Natural soils (as opposed to modern farm soils) can recycle organic compounds, but not inorganic elements.
40. Most of the water flowing in rivers passed through a soil profile or over soil surfaces before reaching the river.

41. Most, if not all, of the nutrient supply stored in a fertile soil is in forms readily available to plants.

42. In humid regions most rainwater that soaks into the soil and is not used by plants eventually flows into rivers and streams.

### Chapter 1 Answers

1. A
2. D
3. A
4. E
5. A
6. B
7. D
8. D
9. A
10. B
11. D
12. B
13. D
14. A
15. D
16. A
17. B
18. B
19. D
20. E
21. A
22. F
23. T
24. T
25. T
26. F
27. T
28. F
29. F
30. F
31. T
32. F
33. F
34. F
35. F
36. F
37. F
38. T
39. F
40. T
41. F
42. T