AGRICULTURE REVIEW

Soil Science (Soil Genesis, Classification, and Survey) Reviewer

1. Who formulated the foundational equation of soil-forming factors (s = f(cl, o, r, p, t))?

1. Vasily Dokuchaev
2. Hans Jenny
3. Justus von Liebig
4. Norman Borlaug

2. Which of the following are considered the 'active' factors of soil formation?

1. Parent material and Time
2. Climate and Organisms
3. Topography and Time
4. Parent material and Relief

3. Which master soil horizon is primarily composed of organic matter in various stages of decomposition?

1. A horizon
2. E horizon
3. O horizon
4. B horizon

4. What master soil horizon is commonly referred to as the 'topsoil' and is characterized by a mix of mineral matter and humified organic matter?

1. O horizon
2. A horizon
3. B horizon
4. C horizon

5. The 'E' master horizon is primarily defined as the zone of:

1. Maximum illuviation
2. Maximum eluviation
3. Maximum organic accumulation
4. Unweathered bedrock

6. Which soil horizon is considered the 'subsoil' or the zone of accumulation (illuviation)?

1. A horizon
2. E horizon
3. B horizon
4. R horizon

7. The 'C' master horizon is best described as:

1. Unconsolidated parent material
2. Hard bedrock
3. Zone of maximum leaching
4. Organic surface layer

8. In the USDA soil taxonomy, which soil order is characterized by a dark, thick, fertile surface horizon typical of grassland ecosystems?

1. Mollisols
2. Spodosols
3. Oxisols
4. Aridisols

9. Which soil order represents highly weathered tropical soils containing significant amounts of iron and aluminum oxides?

1. Alfisols
2. Vertisols
3. Oxisols
4. Inceptisols

10. Soils that exhibit high shrink-swell capacity due to high contents of montmorillonite clay belong to which order?

1. Andisols
2. Ultisols
3. Vertisols
4. Gelisols

11. Which soil order is primarily found in dry, desert climates and often contains accumulations of salt, calcium carbonate, or gypsum?

1. Histosols
2. Aridisols
3. Spodosols
4. Entisols

12. Soils composed almost entirely of organic materials like peat and muck are classified as:

1. Mollisols
2. Histosols
3. Andisols
4. Inceptisols

13. Which soil order represents the youngest soils with little to no profile development or diagnostic horizons?

1. Alfisols
2. Entisols
3. Ultisols
4. Oxisols

14. Soils that have permafrost within 100 cm of the soil surface are classified under which order?

1. Spodosols
2. Gelisols
3. Histosols
4. Aridisols

15. Which soil order is formed primarily from volcanic ash and is known for its high water-holding capacity and phosphorus fixation?

1. Andisols
2. Vertisols
3. Oxisols
4. Alfisols

16. Spodosols are typically acidic soils identified by a subsurface accumulation of humus and:

1. Calcium carbonate
2. Volcanic glass
3. Aluminum and iron oxides
4. Smectite clays

17. Which soil order is strongly leached, possesses an argillic horizon, and has a low base saturation (<35%)?

1. Alfisols
2. Ultisols
3. Entisols
4. Inceptisols

18. Alfisols are distinguished from Ultisols primarily by their:

1. Higher base saturation (>35%)
2. Lack of a B horizon
3. Volcanic origin
4. Presence of permafrost

19. Which soil order represents soils showing mild weathering and the beginning of horizon development, but lacking fully mature features?

1. Entisols
2. Inceptisols
3. Mollisols
4. Oxisols

20. The process of physical weathering is most dominant in which type of climate?

1. Hot and humid
2. Cold and dry
3. Warm and temperate
4. Tropical monsoon

21. Chemical weathering involving the chemical addition of water to a mineral's structure is called:

1. Hydrolysis
2. Hydration
3. Oxidation
4. Carbonation

22. The vertical cross-section of a soil exposing its various horizons is called a:

1. Soil monolith
2. Soil pedon
3. Soil profile
4. Soil catena

23. How does the topographic factor 'slope steepness' generally affect soil formation?

1. It increases water infiltration.
2. It accelerates soil erosion and reduces soil depth.
3. It promotes thick organic matter accumulation.
4. It creates anaerobic soil conditions globally.

24. Parent material that has been transported and deposited by gravity is referred to as:

1. Alluvium
2. Colluvium
3. Aeolian
4. Till

25. Parent material transported and deposited by wind is classified as:

1. Aeolian
2. Lacustrine
3. Alluvial
4. Marine

26. Parent material transported by flowing river water is known as:

1. Colluvium
2. Alluvium
3. Glacial drift
4. Residuum

27. The most basic and specific unit of soil classification used in soil surveys is the:

1. Soil order
2. Soil family
3. Soil series
4. Great group

28. What standardized tool is used by soil scientists worldwide to determine soil color?

1. Pantone Color Guide
2. Munsell Color Chart
3. USDA Texture Triangle
4. Stokes' Law Nomograph

29. In the Munsell color system, what does 'Hue' represent?

1. The lightness or darkness of the color
2. The intensity or purity of the color
3. The dominant spectral color (e.g., Red, Yellow)
4. The moisture content of the soil

30. Which of the following is a passive factor in soil formation?

1. Vegetation
2. Microorganisms
3. Rainfall
4. Parent material

31. The removal of soluble salts and minerals from the upper layers of the soil by the downward movement of water is called:

1. Calcification
2. Leaching
3. Podzolization
4. Salinization

32. Which horizon designates solid, unweathered bedrock?

1. R horizon
2. C horizon
3. B horizon
4. O horizon

33. In soil classification, the highest hierarchical category is the:

1. Subgroup
2. Order
3. Family
4. Suborder

34. Which climate condition leads to the deepest and most intensely weathered soil profiles?

1. Hot and dry
2. Cold and dry
3. Hot and humid
4. Cold and humid

35. Soils formed 'in place' directly from the underlying bedrock are derived from:

1. Transported parent material
2. Residual parent material
3. Cumulose parent material
4. Alluvial parent material

36. Which diagnostic surface horizon (epipedon) is characterized by being thick, dark-colored, high in organic matter, and having a base saturation greater than 50%?

1. Ochric
2. Mollic
3. Umbric
4. Histic

37. In soil horizon notation, a lower-case 't' (e.g., Bt) indicates the illuvial accumulation of:

1. Calcium carbonate
2. Silicate clay
3. Organic matter
4. Iron and aluminum oxides

38. The natural churning and mixing of soil horizons by biological or physical processes (such as shrinking and swelling of clays) is known as:

1. Gleization
2. Pedoturbation
3. Laterization
4. Illuviation

39. Parent materials that are deposited in quiet, freshwater lake environments are termed:

1. Lacustrine
2. Marine
3. Alluvial
4. Aeolian

40. In the USDA Soil Taxonomy hierarchy, which category immediately follows 'Suborder'?

1. Great Group
2. Subgroup
3. Family
4. Series

41. The biochemical process by which raw organic matter is converted into complex, dark, and stable organic compounds in the soil is called:

1. Mineralization
2. Immobilization
3. Humification
4. Nitrification

42. An 'argillic' diagnostic subsurface horizon is best defined by the presence of:

1. High sodium content
2. Significant accumulation of silicate clays
3. Cementation by silica
4. High organic carbon content

43. A sequence of soils of approximately the same age, derived from similar parent material under similar macroclimate, but differing due to variations in relief and drainage is called a:

1. Soil pedon
2. Soil catena
3. Soil profile
4. Soil taxonomy

44. Which diagnostic surface horizon (epipedon) is physically similar to the Mollic epipedon but has a low base saturation (less than 50%)?

1. Melanic
2. Plaggen
3. Umbric
4. Ochric

45. The development of grey, bluish, or greenish soil colors associated with prolonged waterlogging and the reduction of iron is known as:

1. Podzolization
2. Gleization
3. Laterization
4. Calcification

46. Gilgai microtopography (a pattern of micro-basins and micro-knolls) is a distinctive feature resulting from pedoturbation in which soil order?

1. Mollisols
2. Spodosols
3. Vertisols
4. Gelisols

47. In soil taxonomy, the formative element 'ud' in the suborder 'Udults' indicates:

1. A dry moisture regime
2. A humid moisture regime
3. A cold temperature regime
4. A volcanic origin

48. Based on USDA Soil Taxonomy nomenclature, a soil classified as a 'Typic Hapludox' belongs to which soil order?

1. Alfisols
2. Ultisols
3. Oxisols
4. Inceptisols

49. Which of the following diagnostic subsurface horizons is characterized as highly weathered, strongly acidic, at least 30 cm thick, and possessing a very low cation exchange capacity (≤ 16 cmol/kg clay), commonly found in Oxisols?

1. Cambic horizon
2. Argillic horizon
3. Spodic horizon
4. Oxic horizon

50. The intense eluviation of organic matter and iron/aluminum from upper horizons and their subsequent accumulation in a lower horizon (podzolization) is primarily driven by which specific chemical agents?

1. High concentrations of calcium carbonates
2. Low molecular weight organic acids acting as chelates
3. Basic cations mobilized by rapid evaporation
4. Silicate clays expanding and contracting

Answer Key

1. B	**11.** B	**21.** B	**31.** B	**41.** C
2. B	**12.** B	**22.** C	**32.** A	**42.** B
3. C	**13.** B	**23.** B	**33.** B	**43.** B
4. B	**14.** B	**24.** B	**34.** C	**44.** C
5. B	**15.** A	**25.** A	**35.** B	**45.** B
6. C	**16.** C	**26.** B	**36.** B	**46.** C
7. A	**17.** B	**27.** C	**37.** B	**47.** B
8. A	**18.** A	**28.** B	**38.** B	**48.** C
9. C	**19.** B	**29.** C	**39.** A	**49.** D
10. C	**20.** B	**30.** D	**40.** A	**50.** B