Soil Science Reviewer

By Agriculture Review

1. Which of the following factors is NOT part of the CLORPT model of soil formation?

a) Climate

b) Organisms

c) Parent material

d) Tillage

2. In a soil profile, which horizon is typically richest in organic matter and is the topmost mineral horizon?

a) O horizon

b) A horizon

c) B horizon

d) C horizon

3. Which soil texture class contains the highest proportion of clay-sized particles?

a) Sandy loam

b) Silty loam

c) Clay

d) Loamy sand

4. Which of the following is the primary cause of soil acidity in many tropical upland soils?

a) High carbonate content of parent material

b) Leaching of basic cations under high rainfall

c) Excessive liming

d) High sodium adsorption ratio (SAR)

5. Which of the following measurements expresses the soil's ability to retain cations?

a) Bulk density

b) Cation exchange capacity (CEC)

c) Electrical conductivity (EC)

d) Percent base saturation

6. Which form of phosphorus is commonly measured as 'available P' in alkaline soils using the Olsen method?

a) $H_2PO_4^-$ (dihydrogen phosphate)

b) PO_4^{3-} (orthophosphate)

c) Organic P only

d) Condensed polyphosphates

7. Which of the following soil conservation practices is most effective in reducing gully formation on steep slopes?

a) Contour plowing

b) Strip cropping

c) Construction of terraces

d) Reduced tillage

8. Which soil order is typically deep, highly weathered, and common in humid tropical regions including parts of the Philippines?

a) Mollisols

b) Ultisols

c) Aridisols

d) Gelisols

9. Which microorganism group is primarily responsible for biological nitrogen fixation in legume root nodules?

a) Mycorrhizal fungi

b) Rhizobium bacteria

c) Azotobacter

d) Actinomycetes

10. In land capability classification (LCC), which class indicates land suitable for permanent cultivation with only minor limitations?

a) Class I

b) Class II

c) Class III

d) Class IV

11. Which of the following best describes soil bulk density?

a) Mass of soil solids per unit volume of soil (including pore space)

b) Volume of pore spaces per unit mass of soil

c) Mass of water held by the soil at field capacity

d) Percent of organic matter in the soil

12. Which of the following is a correct pairing of deficiency symptom and nutrient in plants?

a) Interveinal chlorosis of new leaves — Nitrogen

b) Stunted growth and purpling of older leaves — Phosphorus

c) Marginal leaf burn on old leaves — Iron

d) General chlorosis of young leaves — Potassium

13. Which amendment is commonly recommended to reclaim sodic soils by replacing exchangeable Na^{+} with Ca^{2+}?

a) Elemental sulfur

b) Gypsum (calcium sulfate)

c) Lime (calcium carbonate)

d) Organic manure only

14. In the context of soil water, which term describes the water content remaining in the soil after excess gravitational water has drained away?

a) Wilting point

b) Saturation

c) Field capacity

d) Permanent wilting point

15. Which test method is commonly used for routine soil pH measurement in a laboratory?

a) Potentiometric measurement with a glass electrode

b) Flame photometry

c) Kjeldahl digestion

d) Atomic absorption spectrophotometry

16. Which of the following best explains why organic matter improves soil structure?

a) Organic matter increases soil pH

b) Organic matter acts as a binding agent, promoting aggregation

c) Organic matter replaces clay particles

d) Organic matter reduces cation exchange capacity

17. Which pesticide-related practice most directly contributes to long-term buildup of pesticide residues in soils?

a) Use of biodegradable pesticides only

b) Frequent use of persistent, lipophilic pesticides

c) Alternating pesticides with different modes of action

d) Integrated pest management (IPM)

18. Which indicator is commonly used to assess soil salinity for irrigation suitability?

a) Soil pH

b) Electrical conductivity (EC)

c) Cation exchange capacity (CEC)

d) Organic carbon content

19. Which of the following is a commonly used biological indicator of good soil health?

a) Low earthworm population

b) High abundance of beneficial soil fauna (e.g., earthworms)

c) High bulk density

d) Absence of microbial activity

20. Which remote-sensing tool is often used to assist soil mapping and identifying land-use suitability?

a) Sonar imaging

b) Satellite multispectral imagery

c) X-ray diffraction

d) Gas chromatography

21. Which of the following soil properties most directly limits root penetration and growth?

a) Soil color

b) High bulk density / compaction

c) High organic carbon

d) Low cation exchange capacity

22. Which nutrient is most commonly associated with promoting early root development and energy transfer in plants?

a) Nitrogen (N)

b) Phosphorus (P)

c) Potassium (K)

d) Calcium (Ca)

23. Which soil testing extractant is commonly used for available phosphorus determination in acid soils (Bray method)?

a) Sodium bicarbonate

b) Bray-1 (acid fluoride mixture)

c) Ammonium acetate

d) DTPA

24. Which of the following is an example of a conservative nutrient management practice?

a) Sole reliance on synthetic fertilizers without soil testing

b) Integrated nutrient management (combining organic and inorganic sources)

c) Excessive broadcast application of nitrogen

d) Continuous monocropping with no residue return

25. Which process describes the conversion of organic nitrogen into mineral forms (ammonium and nitrate) available to plants?

a) Immobilization

b) Mineralization (ammonification and nitrification)

c) Denitrification only

d) Volatilization

26. Which of the following best describes the SAR (Sodium Adsorption Ratio) in irrigation water assessment?

a) Ratio of chloride to bicarbonate

b) Ratio indicating relative concentration of sodium to calcium and magnesium

c) Measure of total dissolved solids only

d) Indicator of soil organic matter content

27. Which of the following best describes the role of mycorrhizae in soils?

a) They antagonize plant roots and reduce nutrient uptake

b) They form symbiotic associations that enhance phosphorus uptake

c) They fix atmospheric nitrogen in root nodules

d) They primarily increase soil pH

28. Which soil color notation system is commonly used in field soil descriptions?

a) Pantone color system

b) Munsell color system

c) RGB color model

d) CMYK color model

29. Which of the following statements about peat soils is CORRECT?

a) Peat soils are highly decomposed and have very high bulk density

b) Peat soils are rich in organic matter and are prone to subsidence when drained

c) Peat soils typically have very high mineral nutrient reserves

d) Peat soils are common in arid regions

30. Which of the following is a direct consequence of long-term continuous monocropping on soil?

a) Increased crop biodiversity

b) Build-up of specific pests and nutrient depletion

c) Immediate increase in soil organic matter

d) Reduced soil erosion automatically

31. Which of the following is the BEST immediate measure to reduce surface runoff and soil loss on a newly planted sloping field?

a) Install tile drains

b) Establish cover crops or mulches

c) Apply high doses of nitrogen fertilizer

d) Increase tillage intensity

32. Which Philippine soil order or major soil group is commonly associated with clay soils that swell when wet and crack when dry (vertisols)?

a) Oxisols

b) Vertisols

c) Histosols

d) Entisols

33. Which of the following is an advantage of using green manures in cropping systems?

a) They increase soil erosion

b) They add organic matter and can fix atmospheric nitrogen

c) They permanently eliminate weeds

d) They reduce soil moisture retention

34. Which laboratory method is typically used to determine soil texture by separating sand, silt and clay?

a) Hydrometer or sieve–pipette method

b) Loss on ignition

c) Kjeldahl digestion

d) DTPA extraction

35. What is the major environmental risk associated with excessive application of nitrogen fertilizers in wet tropical systems?

a) Increased phosphorus fixation

b) Leaching to groundwater and denitrification losses (nitrate pollution)

c) Immediate increase in soil organic carbon

d) Reduced soil pH to neutral

36. Which of the following practices helps increase soil organic carbon over time?

a) Burning crop residues

b) Incorporation of crop residues and use of manures/compost

c) Continuous deep plowing with residue removal

d) Repeated fallowing without vegetation

37. Which of the following statements about soil texture and water-holding capacity is TRUE?

a) Sandy soils typically have higher available water capacity than clay soils

b) Clay soils retain more water overall but much of it may be at tensions unavailable to plants

c) Texture has no influence on water-holding capacity

d) Loamy sand holds the most plant-available water

38. Which of the following is a common practice to reclaim saline soils for crop production?

a) Leaching salts below the root zone with good-quality water and improving drainage

b) Increasing salt inputs through irrigation

c) Removing topsoil only

d) Avoiding any irrigation permanently

39. Which soil testing extractant is commonly used to estimate available micronutrients like Fe, Mn, Zn, and Cu?

a) Olsen P

b) DTPA (diethylenetriaminepentaacetic acid)

c) Bray-1

d) Ammonium acetate

40. Which Indonesian/Philippine-relevant soil limitation would most likely require both drainage improvement and salt leaching for reclamation?

a) Acid sulfate soils with secondary salinization

b) Well-drained upland Ultisols

c) Sandy coastal dunes with low salt

d) Rocky shallow Entisols

41. Which of the following is an integrated practice to reduce greenhouse gas emissions from rice paddies?

a) Continuous flooding throughout the season

b) Alternate wetting and drying (AWD) combined with optimized nitrogen management

c) Excessive organic amendments without drainage

d) Burning rice straw in the field

42. Which tool or practice helps farmers determine the right lime requirement for acid soils?

a) Measuring electrical conductivity (EC)

b) Soil buffering capacity tests and pH measurement

c) Estimating from bulk density alone

d) Visual soil color only

43. Which of the following is a primary reason for conducting a soil survey at the farm or watershed level?

a) To determine farmers' cultural practices

b) To map soil types and their suitability for different land uses

c) To set commodity market prices

d) To measure daily weather variations

44. Which practice helps reduce phosphorus runoff from agricultural fields?

a) Broadcasting high rates of P fertilizer just before heavy rains

b) Band placement of phosphorus near seed and buffer strips along waterways

c) Removing vegetation from riparian zones

d) Increasing soil erosion intentionally

45. Which of the following is TRUE regarding conservation tillage?

a) It always increases immediate crop yields regardless of context

b) It reduces soil disturbance and can increase residue cover, improving erosion control

c) It eliminates the need for crop rotation

d) It is synonymous with burning residues

46. Which of the following best describes soil buffering capacity?

a) Soil's resistance to change in temperature

b) Soil's resistance to change in pH when acids or bases are added

c) Soil's ability to hold water at field capacity

d) Soil's color variation range

47. Which of the following management options is most appropriate for a farmer dealing with iron deficiency chlorosis in calcareous soils?

a) Apply phosphate fertilizers only

b) Use iron chelates or foliar iron sprays and consider soil amendments to lower pH locally

c) Apply more lime

d) Increase sodium in the soil

48. Which statement about soil microbial activity is CORRECT?

a) Microbial activity is unaffected by soil moisture and temperature

b) Microbial activity generally increases with optimal moisture and moderate temperatures

c) High salinity always increases microbial activity

d) Microbial activity is highest in sterile soils

49. Which of the following is an example of an in-situ remediation technique for soils contaminated with petroleum hydrocarbons?

a) Excavation and landfilling off-site

b) Bioventing (enhancing microbial degradation in place)

c) Incineration off-site

d) Exporting soil to industrial dumps

50. Which farming measure helps both soil conservation and improvement of on-farm nutrient cycling simultaneously?

a) Continuous removal of crop residues

b) Agroforestry or alley cropping with periodic incorporation of prunings

c) Sole reliance on synthetic N at high rates

d) Replacing perennial vegetation with bare fallow

Answer Key

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