

**AGA-154: Fundamentals of Soil Science**  
**Northeast Iowa Community College – Calmar, Iowa (Tad Mueller)**  
**Question Bank (Answers Highlighted in Yellow)**

- 1) When gravity and capillary forces are the same SMT = \_\_\_\_\_
  - a) 1/3
  - b) 15
  - c) 30
  - d) 0
  
- 2) One acre furrow slice of soil weighs:
  - a) 2,000,000 pounds
  - b) 100 tons
  - c) 10,000 lbs.
  - d) Way too much
  
- 3) How does adding lime change the pH of the soil?
  - a) It replaces hydrogen ions with calcium.
  - b) It dilutes the acid.
  - c) It leaches the acid out.
  - d) It increases the bacterial activity.
  
- 4) Which horizon has the highest amount of organic matter?
  - a) A horizon
  - b) B horizon
  - c) O horizon
  - d) C horizon
  
- 5) The corn stalk N test is good for making recommendations for the current year.
  - a) true
  - b) false
  
- 6) A Udic Haplustoll \_\_\_\_\_ than a Typic Haplustoll.
  - a) developed under a somewhat drier microclimate.
  - b) is slightly older.
  - c) is slightly younger.
  - d) developed in a slightly wetter microclimate.
  
- 7) What is the make-up of the idealized soil?
  - a) 10% Organic Matter and 90% Mineral
  - b) 50% Air, 50% Soil
  - c) 16.6% Air, 33.3% Water, 5% Organic Matter, and 45% Mineral

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- d) 50% Bulk Density and 50% Particle Density
- 8) A windbreak will protect a soil for distance \_\_\_\_\_ times its height.
- a) One
  - b) Five
  - c) Ten
  - d) One Hundred
- 9) What is the best SMT for plant growth.
- a) 1/3
  - b) 3 to 4
  - c) 10 to 15
  - d) Greater than 15
- 10) How many Land Capability Classes are there?
- a) Four
  - b) Eight
  - c) Ten
  - d) One Hundred
- 11) What would you call a moisture regime that is moist for most of the growing season?
- a) Aquic
  - b) Udic
  - c) Adic
  - d) Xeric
- 12) An Aquic Paleudult would be called a (an) \_\_\_\_\_ at the subgroup level.
- a) Aquic Paleudult
  - b) Paleudult
  - c) Udult
  - d) Ultisol
- 13) What is the advantage of dolomitic limestone?
- a) It's cheaper.
  - b) It provides two secondary nutrients as well as neutralizing the soil.
  - c) It reacts more quickly.
- 14) What would you call a soil that has a diagnostic horizon with a zone of accumulated clays and basic in pH?
- a) Ultisol
  - b) Alfisol
  - c) Agralf

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- d) Alaguult
- 15) What is the process called when wind spins a soil particle so fast that it flies up into the air.
- a) Saltation
  - b) Spinning
  - c) Suspension
  - d) Splash Erosion
- 16) The amount of available phosphorus in an acre of soil at any one time is \_\_\_\_\_.
- a) less than 1 pound
  - b) 5-20 pounds
  - c) 50-75 pounds
  - d) greater than 100 pounds
- 17) If the clay fraction is dominated by 2:1 silicate clay, the soil is more likely to be in the \_\_\_\_\_ order.
- a) Mollisols
  - b) Alfisols
  - c) Oxisols
  - d) Aridisols
- 18) What does CSR stand for?
- a) Crop Suitability Rating
  - b) Corrected Soil Rate
  - c) Carst Soil Remnant
  - d) Carp Sick River
- 19) What percent slope is a C slope soil?
- a) 0-2
  - b) 2-4
  - c) 4-6
  - d) 5-9
- 20) There is solid scientific research that shows organic farming is better for the soil.
- a) True
  - b) False
- 21) Species of Rhizobium that fix nitrogen symbiotically with alfalfa also will fix nitrogen symbiotically with soybeans.
- a) True
  - b) False

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- 22) If 200 pounds of 2-20-18 (oxide) analysis fertilizer was applied per acre, how many pounds of P<sub>2</sub>O<sub>5</sub> were applied?
- a) 4
  - b) 36
  - c) 40
  - d) 400
- 23) What would be the approximate CEC of a Minnesota soil that contains 30% clay and 2% organic matter?
- a) 10
  - b) 14
  - c) 19
  - d) 23
  - e) 38
- 24) You have a wheelbarrow loaded with 200# of soil. It has a Pw of 12%. How much lighter would the load be if it were oven dry?
- a) 24 lbs
  - b) 21.4 lbs
  - c) 12 lbs.
  - d) still too heavy to push.
- 25) Which of the following nutrients is taken up by the plant as an anion?
- a) P
  - b) Ca
  - c) Mg
  - d) K
- 26) Of a 30 inch rainfall how much actually leaches through to the groundwater?
- a) 3"
  - b) 5.5"
  - c) 21.5"
  - d) 30"
- 27) What is the term used for the ability of a soil to hold positively charged nutrients?
- a) Organic Matter Content
  - b) Structure
  - c) Cation Exchange Capacity
  - d) Texture
- 28) Which type of process attaches water to a soil particle like glue?

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- a) Adhesion
- b) Cohesion
- c) SMT
- d) Saturation

29) A good sound manure management plan considers all but which of the following?

- a) Economically Feasible
- b) Environmentally Friendly
- c) Agronomically Sound
- d) Socially Responsible
- e) Mechanically Sound

30) If you want a quick fix to a micronutrient deficiency it is best to apply it in the \_\_\_\_\_ form.

- a) Sulfate
- b) Oxide
- c) Neither is fast-reacting
- d) Both are final

31) What is "HEL"?

- a) Hillside Erosion Length
- b) Highly Erodible Land
- c) Highest Elevation with a Lookout
- d) A place sinners go.

32) On acid soils, phosphorus is made unavailable by reacting with \_\_\_\_\_.

- a) Ca and Mg
- b) Fe and Mn
- c) Mn and Ca
- d) Fe and Al

33) Because of the small quantities required it is easy to evenly apply micronutrients to the field.

- a) true
- b) false

34) What would be the abbreviation for a Corn/Oats/Alfalfa/Alfalfa rotation?

- a) COAA
- b) COA
- c) COMM
- d) COaAlAl

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- 35) Fall tillage will result in a better seedbed for planting.  
a) True  
b) False
- 36) Which of the following is NOT a general category of native vegetation?  
a) Prairie  
b) Brush  
c) Forest  
d) Transition
- 37) A Cryorthod would have a \_\_\_\_\_.  
a) barrier to root development other than a strong Bt  
b) salt problem  
c) shallow root zone  
d) short growing season  
e) strongly developed Bt horizon
- 38) What is the most common mineral in soil?  
a) Feldspar  
b) Quartz  
c) Phosphorous  
d) Potassium
- 39) N-Serve keeps nitrogen fertilizer in which form?  
a) N<sub>2</sub> (gas)  
b) NO<sub>3</sub><sup>-</sup>  
c) NO<sub>2</sub><sup>-</sup>  
d) organic nitrogen  
e) NH<sub>4</sub><sup>+</sup>
- 40) Micronutrients are not as important to plants as macronutrients.  
a) true  
b) false
- 41) A metal-organic compound is called a:  
a) Chelate  
b) Sulfate  
c) Frit  
d) Oxide
- 42) Which of the following types of rock would you most likely find around a volcano?  
a) Sedimentary

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- b) Metamorphic
- c) Basalt
- d) Slate

43) An example of a gas that is frequently used as a fertilizer is \_\_\_\_\_.

- a) ammonia
- b) nitrogen
- c) sulfur
- d) ammonium sulfate

44) Accurate soil testing is available for which of the following micronutrients?

- a) Fe
- b) Zn
- c) Mo
- d) S
- e) Bo
- f) All answers are correct

45) What would be the approximate CEC of a soil that contains 4% organic matter and 20% Illite Clay?

- a) 6
- b) 8
- c) 14
- d) 24
- e) 30

46) In which of the following soils will you most likely to find "mottles"?

- a) Well-Drained
- b) Moderately Well-Drained
- c) Poorly Drained
- d) Very Poorly Drained

47) Iron, zinc, and manganese added to a fertilizer are examples of:

- a) carriers.
- b) conditioners.
- c) neutralizers.
- d) fillers.
- e) specialty ingredients.

48) The late spring nitrate test should be conducted when:

- a) when the corn is planted
- b) when the corn first emerges

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- c) when the corn is 12 inches high
- d) around the 4th of July
- e) at tasseling.

49) What would you call a diagnostic horizon that occurs as a mineral layer between the A and B horizons?

- a) Argillic
- b) Cambic
- c) Albic
- d) Natric

50) Which soil will warm up fastest in the spring?

- a) Sand
- b) Silt
- c) Clay
- d) Loam

51) Which of the following soil orders are found most commonly in the Appalachian Mountains?

- a) Entisols
- b) Inceptisols
- c) Mollisols
- d) Arenisols

52) If the soil is high in magnesium and the soil contains much more silicon than aluminum, \_\_\_\_\_ will be the dominant clay.

- a) Montmorillonite
- b) Illite
- c) Kaolinite
- d) Oxide clays

53) Green sands are:

- a) a liming material rich in magnesium.
- b) a metamorphic form of sandstone containing calcium.
- c) a sediment rich in potassium.
- d) an organic fertilizer.
- e) responsible for potassium fixation.

54) Very little water will move through a crack if it is not open to the surface.

- a) True
- b) False

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55) What is the Lyotropic Series?

- a) A ranking of nutrients in how tightly they are held by the soil.
- b) A group of cations that dissolve in lye.
- c) A ranking of pH of soils.
- d) A listing of bases that lower the pH of a soil.

56) Luxury consumption could best be described as:

- a) a nutrient deficiency.
- b) increased uptake leading to decreased plant growth.
- c) increased uptake without influencing plant growth.
- d) increased uptake leading to increased plant growth.
- e) decreased uptake without influencing plant growth.

57) One would expect the most potassium fixation in \_\_\_\_\_ soils.

- a) clayey
- b) loamy
- c) sandy
- d) silty
- e) stoney

58) When a plant is at permanent wilting point there is not water left in the soil.

- a) True
- b) False

59) The charge of Ca is \_\_\_\_.

- a) -2
- b) -1
- c) 0
- d) +1
- e) +2

60) What percentage of a phosphorus fertilizer would not be used by the plant the first year it was applied?

- a) 10%
- b) 20%
- c) 50%
- d) 80%
- e) 100%

61) Three fertilizers are offered for sale: 5-10-10, 8-16-16 and 10-20-20. These materials all have the same \_\_\_\_\_.

- a) formula

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- b) analysis
- c) guarantee
- d) ratio
- e) rate

62) The most common anion form of nitrogen taken up by plants is \_\_\_\_\_.

- a) ammonia
- b) ammonium
- c) nitrate
- d) nitrite

63) What is CEC?

- a) Calculated value that is an estimate of the soil's ability to attract, retain, and exchange cation elements.
- b) An indication of the organic matter content of a soil.
- c) A measurement of how many positively charged nutrients that a soil can hold.
- d) Cats Escaping Capture

64) You should take \_\_\_\_\_ cores for each sampling area.

- a) 3 - 5
- b) 5 - 10
- c) 10 - 15
- d) 15 - 20
- e) a minimum of 20

65) Plants may die when bulk density is greater than:

- a) gm/cc
- b) 1.6 gm/cc
- c) 1.85 gm/cc
- d) 2.65 gm/cc

66) The major portion of soil nitrogen is found as:

- a) exchangeable ammonium.
- b) soluble nitrate.
- c) organic nitrogen compounds.
- d) exchangeable nitrate.
- e) mineral nitrogen.

67) A very poorly drained soil will be which of the following colors?

- a) Yellow
- b) Black
- c) Grey

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d) Red

68) Which of the following is NOT a device used to measure soil moisture?

- a) Pressure Plate
- b) Tensiometer
- c) Bouyoucos Block
- d) SMT Meter

69) Which of the following types of erosion has the least overall effect on the productivity of the soil.

- a) Sheet Erosion
- b) Rill Erosion
- c) Gully Erosion
- d) Splash Erosion

70) What is the term for the breaking down of a soil mineral?

- a) Leaching
- b) Decomposition
- c) Resynthesizing
- d) Weathering

71) Denitrification is the conversion of:

- a) nitrite to nitrate.
- b) nitrate to  $\text{NH}_3$ .
- c)  $\text{NH}_3$  to nitrite.
- d) nitrate to nitrite.
- e) nitrate to  $\text{N}_2$  gas.

72) What soil order would the shifting sand dunes of the Sahara Desert be in?

- a) Entisol
- b) Inceptisol
- c) Mollisol
- d) Psamment

73) What is the point when no air exists in the soil.

- a) Field Capacity
- b) Saturation
- c) Permanent Wilting Point
- d) Air Dry

74) Which of the following fertilizer grades will supply 16 pounds of potash when 50 pounds of fertilizer is used?

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- a) 4-20-40
- b) 8-16-32
- c) 10-6-4
- d) 0-20-0
- e) 10-10-10

75) How many pounds of 0-50-0 would be used to supply the P<sub>2</sub>O<sub>5</sub> in a 40# bag of 2-15-40?

- a) 18.75
- b) 16
- c) 133
- d) 12
- e) 8.3

76) In a 16-6-12 fertilizer, the 12 indicates that the fertilizer contains:

- a) 12% water soluble potassium as K<sub>2</sub>O.
- b) 12# of total potassium.
- c) 12% citric acid soluble potassium as K<sub>2</sub>O.
- d) 12% total potassium.
- e) 12% available phosphorus.

77) Poorly managed Ultisols that are abandoned after 2-3 years are an example of:

- a) Shifting Agriculture
- b) Production Agriculture
- c) Brazilian Agriculture
- d) Sustainable Agriculture

78) Your soil test report calls for 150# of nitrogen/Ac. How many pounds of urea (45-0-0) should be applied to meet this need?

- a) 0
- b) 33
- c) 67
- d) 333
- e) 675

79) Cation Exchange takes place within the clay crystal and is irreversible.

- a) true
- b) false

80) The utilization of atmospheric nitrogen by microbes is called \_\_\_\_\_.

- a) nitrogen fixation
- b) nitrification

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- c) denitrification
- d) ammonification
- e) none of the above

81) What kind of test is done before designing a drainage system or septic system?

- a) Texture test
- b) Permeability Test
- c) Shear Test
- d) Perc Test

82) If the soil is high in potassium and there is much more silicon than aluminum,

\_\_\_\_\_ will be the dominant clay.

- a) Montmorillonite
- b) Illite
- c) Kaolinite
- d) Oxide clays

83) Which of the following is the correct Universal Soil Loss Equation?

- a)  $SL = CSR \times R \times L$
- b)  $A = RKSLCP$
- c)  $SL = \text{Rain} \times \text{Slope} \times \text{Tillage}$
- d)  $SL = \text{Length} \times \text{Height} \times \text{Slope of field}$

84) What would you call an epipedon that has a medium organic matter level and more than 50% base saturation?

- a) Ochric
- b) Histic
- c) Mollic
- d) Umbric

85) Which of the following would provide the greatest limitations for a Septic Tank Field?

- a) Slope
- b) Percs Slowly
- c) Pan
- d) Flooding

86) According to the Food Security Act a 50 acre farm that had 15 acres of HEL soil would be considered Highly Erodible Land.

- a) True
- b) False

87) Most of the nitrogen lost from the soil by leaching is usually in the form of \_\_\_\_\_.

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- a) nitrite
- b) ammonium
- c) nitrate
- d) N<sub>2</sub>

88) Volcanic glass is unique because it is:

- a) primarily basalt
- b) low in quartz
- c) amorphous
- d) a clear mineral

89) The rate of replacement of available nutrient from insoluble compounds or organic materials in the soil as they are removed by plants is more critical for \_\_\_\_\_ than any other macronutrient.

- a) calcium
- b) nitrogen
- c) phosphorus
- d) potassium
- e) sodium

90) Which of the forms of fertilizers may cake, making application difficult?

- a) solids and gases
- b) fluids and anhydrous ammonia
- c) solids
- d) only liquids
- e) only inert granules

91) At any one time, most of the unavailable sulfur in the soil is \_\_\_\_\_.

- a) in insoluble iron and aluminum compounds
- b) fixed by clay minerals
- c) in sulfur dioxide
- d) in organic compounds
- e) They have deep cracks in dry weather.

92) The charge of Mg is \_\_\_\_.

- a) -2
- b) -1
- c) 0
- d) +1
- e) +2

93) Most nutrient deficiencies cause discoloration or abnormality in a plant.

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- a) true
- b) false

94) What is the term that refers to how well a soil responds to manipulation?

- a) Tilt
- b) Structure
- c) Shear
- d) Texture

95) Which of the following will have the highest shrink-swell?

- a) Kaolinite
- b) Illite
- c) Montmorillonite
- d) Vermiculite

96) What would be the texture of a soil that forms a fair ribbon and feels gritty?

- a) Loam
- b) Clay Loam
- c) Sandy Clay Loam
- d) Sandy Loam

97) The symbiotic association between \_\_\_\_\_ used to be responsible for fertility maintenance before the introduction of cheap nitrogen fertilizer.

- a) soybeans and azotobacter
- b) alfalfa and Rhizobia
- c) sweet clover and fungi
- d) wheat and actinomycet

98) What is the percent pore space in a soil that has a particle density of 2.0 and a bulk density of 1.5?

- a) 75%
- b) 25%
- c) 50%
- d) 0.5

99) Under anaerobic soil conditions \_\_\_\_\_ will occur.

- a) ammonification
- b) immobilization
- c) nitrification
- d) denitrification
- e) All of these occur under anaerobic conditions.

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- 100) In a wet year what would be more desirable?
- A loam soil with no stratification.
  - A loam soil stratified over top of a clay soil.
  - A loam soil stratified over a sand soil.
  - A sand soil with not stratification.
- 101) What is the symbol used for the amount of soil loss that is acceptable.
- A
  - T
  - @
  - #
- 102) What is the approximate CEC of a soil that contains 10% Vermiculite and 3% Organic Matter
- 6
  - 15
  - 21
  - 210
  - 60
- 103) The most commonly used potassium fertilizer is \_\_\_\_\_.
- K<sub>2</sub>SO<sub>4</sub>
  - KNO<sub>3</sub>
  - KCl
  - none of these
- 104) Where would the soil most likely contain an adequate supply of sulfur for optimum plant growth?
- in Northeastern California
  - near industrial areas
  - where the soil has been intensively cropped for a number of years
  - where legumes have been grown for hay for long periods
  - allow for drainage of excess water.
- 105) A Typic Durorthid at the order level would be called a(an) \_\_\_\_\_.
- Aridisol
  - Durorthid
  - Typic Durorthid
  - Orthid
  - None of the above are correct.

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- 106) Sap and Tissue analysis are the same thing.  
a) True  
b) False
- 107) Alfisols are usually dominated by \_\_\_\_\_ in their clay fraction.  
a) 2:1 silicate clay  
b) a mixture of 2:1 and 1:1 silicate clay  
c) 1:1 clay with some oxide clays  
d) oxide clays with some 1:1 clay
- 108) In alkaline soils, the availability of phosphorus is restricted because of its interaction with \_\_\_\_\_ to form insoluble compounds.  
a) iron  
b) aluminum  
c) aluminum and iron  
d) calcium
- 109) What is the most critical time of water needed for a plant?  
a) Germination  
b) Early Growth  
c) Pollination  
d) Maturity
- 110) Nutrient deficiency symptoms are a good and easy way to assess nutrient needs.  
a) true  
b) false
- 111) Ammonium nitrate is an acid forming fertilizer because \_\_\_\_\_.  
a)  $\text{NH}_4^+$  is nitrified.  
b)  $\text{NH}_4^+$  leaches from the soil  
c)  $\text{NH}_4^+$  is fixed.  
d)  $\text{NO}_3^-$  is denitrified.  
e)  $\text{NO}_3^-$  leaches from the soil
- 112) Which of the following nitrogen fertilizers is the most dangerous to handle?  
a) Ammonium Nitrate  
b) Anhydrous Ammonia  
c) Aqua Ammonia  
d) Sodium Nitrate  
e) Ammonium Sulfate
- 113) What is the term for when clays have moved into the B horizon?

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- a) Eluviation
  - b) Illuviation**
  - c) Solum
  - d) E horizon
- 114) What area of the soil has the greatest amount of microbial activity?
- a) The top 1/4 inch.
  - b) The rhizosphere**
  - c) The troposphere
  - d) The humus
- 115) A fertilizer labeled as 33-0-0 in the oxide system would be a \_\_\_\_\_ in the elemental system of labeling fertilizers.
- a) 14-0-0
  - b) 27%
  - c) 33%**
  - d) 42%
- 116) A ton of 2-20-18 fertilizer will provide \_\_\_\_\_ pounds of available nitrogen.
- a) 40**
  - b) 100
  - c) 360
  - d) 400
- 117) In 1995 \_\_\_\_\_ % of soils ISU soil test lab tested high to very high.
- a) 25
  - b) 50
  - c) 75**
  - d) 100
- 118) Which of the following is not a metal micronutrient?
- a) Fe
  - b) Cu
  - c) Mn
  - d) Zn
  - e) Mo**
- 119) The transformation of ammonium to nitrate is called:
- a) ammonification.
  - b) immobilization.
  - c) mineralization.
  - d) nitrogen fixation.

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e) nitrification.

120) When taking soil samples, you should stay at least \_\_\_\_\_ feet away from gravel road.

- a) 50
- b) 100
- c) 150
- d) 200
- e) 300

121) Which of the following organisms occur in the greatest number in the soil?

- a) Algae
- b) Actinomycetes
- c) Fungi
- d) Bacteria

122) Which soil are you most likely to find an "O" and an "E" horizon in?

- a) Prairie
- b) Brush
- c) Forest
- d) Transition

123) Which of the following is not a benefit of organic matter in the soil?

- a) Better soil structure
- b) Higher CEC
- c) Contains many plant nutrients.
- d) Greater soil depth

124) Which of the following elements does not form organic compounds in the plant?

- a) calcium
- b) magnesium
- c) potassium
- d) phosphorus

125) Typic Ustochrept is a soil \_\_\_\_\_ name.

- a) series
- b) great group
- c) suborder
- d) subgroup
- e) family

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- 126) What is the bulk density of a soil that weighs 200 grams and takes up a space 2 cm x 5 cm x 10 cm?  
a) 2.0 g/cc  
b) 2.65 gm/cc  
c) 0.5 g/cc  
d) 1.32 g/cc
- 127) The loss of ammonia to the atmosphere when the ammonium ion (NH<sub>4</sub><sup>+</sup>) is converted to ammonia gas (NH<sub>3</sub>) occurs when the soil pH is:  
a) high.  
b) neutral.  
c) low.
- 128) What soil order is considered the most naturally fertile?  
a) Entisol  
b) Inceptisol  
c) Mollisol  
d) Udoll
- 129) One of the most serious limitations to the management of Vertisols is:  
a) they have a low base saturation.  
b) they are low in organic matter.  
c) they have a narrow moisture range over which they can be easily tilled.  
d) they have a low buffering capacity.  
e) they have a low water holding capacity.
- 130) What level of taxonomy is an Udifluent in?  
a) Order  
b) Suborder  
c) Great Group  
d) Subgroup
- 131) The process of ammonium fixation is most closely related to \_\_\_\_\_ fixation.  
a) Ca  
b) N<sub>2</sub>  
c) P  
d) K  
e) S
- 132) What is a pedon?  
a) A segment of soil 1 meter in diameter to the depth of rooting.  
b) A cross section of the soil

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- c) A layer in the profile of a soil sample
  - d) A part of a flower
- 133) Calcium is:
- a) very mobile in the soil and therefore an important source of agricultural pollution
  - b) not an important plant nutrient
  - c) usually deficient in the soil
  - d) added to the soil in lime.
  - e) Both 3 and 4 are correct.
- 134) Potassium deficiencies would be most common in the pH range \_\_\_\_\_.
- a) 4.0 to 5.5
  - b) 5.0 to 6.5
  - c) 6.0 to 7.5
- 135) Which of the following is considered a high energy transporter.
- a) River
  - b) Glacier
  - c) Ocean
  - d) Wind
- 136) The arrangement of soil particles is called:
- a) Texture
  - b) Structure
  - c) Ped
  - d) Pedon
- 137) Which of the following microbes is capable of photosynthesis?
- a) Algae
  - b) Actinomycetes
  - c) Fungi
  - d) Earthworms
- 138) The most reduced form of sulfur is \_\_\_\_\_.
- a) SO<sub>2</sub>
  - b) SO<sub>3</sub><sup>--</sup>
  - c) SO
  - d) S<sup>—</sup>
- 139) How much power does a one inch rainfall have on one acre of land?
- a) As much as an atom bomb
  - b) As much as a quarter ton of TNT

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- c) 300 foot lbs.
  - d) 43,560 inch lbs.
- 140) Which of the following is NOT one of the steps of soils testing?
- a) Taking a good soil sample
  - b) Properly analyzing the sample
  - c) Interpreting the analysis
  - d) Adjusting the recommendations to your situation
  - e) Find a good lab.

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