

- 30) Tensiometers are instruments that are inserted in the soil to measure _____.
a) soil moisture tension b) temperature
c) nutrient content d) organic matter content
e) psychological stress
- 31) Which will be cooler: the soil under a clear plastic mulch or under a black plastic mulch?
a) black plastic b) clear plastic
- 32) Which of the following IS NOT a benefit or use of mulches?
a) increases run-off of water b) decreases water loss by evaporation
c) decreases weed growth d) stabilizes soil temperature
e) all are benefits or uses of mulches
- 33) Which of the following is an essential element that is naturally supplied by air or water?
a) K b) Ca
c) Mo d) C
e) Cu
- 34) Which of the following is mobile?
a) Zn b) B
c) Ca d) Mn
e) K
- 35) Which of the following is more available at an intermediate pH?
a) P b) N
c) K d) Mo
e) Ca
- 36) Which of the following is the best (most economical) purchase? A 50 pound bag of 5-10-5 fertilizer for \$10.00 a bag, or a 50 pound bag of 10-15-10 fertilizer for \$15.00 a bag.
a) the 5-10-5 fertilizer b) the 10-15-10 fertilizer
- 37) A 12-16-8 fertilizer contains ____ N.
a) 12% b) 16%
c) 8% d) 36%
e) 64%
- 38) Which of the following would be the best fertilizer for my wife to use to fertilize her flowering geraniums? (and yes my wife likes her geraniums to flower a lot)
a) 20-20-20 b) 20-10-10
c) 10-20-20 d) 20-10-5
e) hey buddy, they would all work equally well in causing your wife's geraniums to flower
- 39) Of all the nutrients, which of the following is required by plants in the smallest quantities?
a) Cu b) B
c) Mn d) Mo
e) S
- 40) What is the main reason why nitrate nitrogen is so easily leached from the soil?
a) because it is very soluble b) because it is negatively charged
c) because it is volatile d) because it is positively charged
e) because moss don't grow on a rolling stone

NAME _____ SIGNATURE _____

HORT 201 – 3rd EXAM – (s01)

Carefully mark answers on the scantron. Only answers marked on the scantron will be graded.

- 1) _____ is the shrinkage of individual cells due to loss of turgor pressure that causes a cell to become flaccid.
 - a) wilting
 - b) osmosis
 - c) plasmolysis
 - d) shrinkage
 - e) deflation
- 2) The driving force for growth in size, by causing expansion, is _____.
 - a) osmosis
 - b) cell division
 - c) mitosis
 - d) turgor pressure
 - e) gibberellic acid
- 3) Which method of expressing humidity is the amount of water vapor in air expressed as a percentage of the amount of water vapor that could be held at saturation?
 - a) relative humidity
 - b) vapor pressure
 - c) absolute humidity
 - d) barometric pressure
 - e) specific humidity
- 4) When warm air rises in the atmosphere, its temperature _____ and its humidity _____.
 - a) decreases / decreases
 - b) increases / decreases
 - c) increases / increases
 - d) decreases / increases
- 5) What type of precipitation happens if condensation occurs below freezing (e.g. the dew point is below freezing)?
 - a) hail
 - b) snow
 - c) rain
 - d) dew
 - e) fog
- 6) What is the name of the major aquifer in central Texas that supplies much of the water for the San Antonio area?
 - a) Edwards
 - b) Ogallala
 - c) Colorado
 - d) Brazos
 - e) Bush
- 7) What is name of the non-functional (dead) xylem in the center of tree trunks, and which does not translocate water?
 - a) phloem
 - b) sapwood
 - c) heartwood
 - d) xylemwood
 - e) suberized endodermis
- 8) In the Cohesion Theory of translocation, transpiration causes a _____ pressure in leaves that causes the water to flow up stems.
 - a) positive
 - b) negative
- 9) What part of the root absorbs most of the water a plant takes up?
 - a) root tip
 - b) older roots
 - c) root epidermis
 - d) Casparian strip
 - e) root hairs

- 10) Which of the following will tend to decrease transpiration?
- a) waxy leaves
 - b) high humidity
 - c) low temperature
 - d) darkness for C3 and C4 plants
 - e) all will tend to decrease transpiration
- 11) Newly transplanted trees can be sprayed with which of the following to decrease their transpiration and increase their chance of survival?
- a) auxin
 - b) antitranspirant
 - c) ethylene
 - d) humectant
 - e) coatifier
- 12) What is the most commonly used irrigation system for turfgrass and lawns?
- a) sprinkler
 - b) basin
 - c) chapin tube
 - d) flood
 - e) drip
- 13) What type irrigation system is recommended for use in xeriscaping?
- a) sprinkler
 - b) basin
 - c) chapin tube
 - d) flood
 - e) drip
- 14) What is the name of the electrically operated valves used to automate irrigation systems?
- a) tensiometer
 - b) quantum sensor
 - c) solenoid
 - d) alternator
 - e) capacitor
- 15) Which of the following irrigation systems keeps the foliage dry and thus allows the plants to have less foliar disease?
- a) capillary mat
 - b) chapin tube
 - c) subirrigation
 - d) none keep the foliage dry
 - e) all keep the foliage dry
- 16) Which is the most fertile horizon in the soil?
- a) A
 - b) B
 - c) C
 - d) D
 - e) E
- 17) _____ is an impermeable layer in the soil due to high clay.
- a) hard pan
 - b) clay pan
 - c) pottery pan
 - d) plow pan
 - e) peter pan
- 18) A _____ soil contains less than 20% organic matter.
- a) humic
 - b) muck
 - c) mineral
 - d) peat
 - e) geologic
- 19) The highly decomposed, fine, amorphous organic matter in soil is called _____.
- a) humus
 - b) compostic
 - c) muck
 - d) peat
 - e) litter

- 42) Which nutrient forms pectates in the middle lamella of cell walls and helps cement adjacent cells together?
- a) Cu
 - b) Ca
 - c) Mg
 - d) Zn
 - e) N
- 43) Which nutrient is a component of nucleic acids in DNA and RNA?
- a) P
 - b) B
 - c) S
 - d) Mo
 - e) K
- 44) Which term means yellowing of leaves?
- a) interveinal
 - b) jaundice
 - c) chlorosis
 - d) yellowing
 - e) necrosis
- 45) Which nutrient is needed by plants in the smallest quantities?
- a) Fe
 - b) B
 - c) Cu
 - d) Zn
 - e) Mo
- 46) Witches broom is an abnormality of pecan trees in Texas that is caused by a nutrient deficiency. Which nutrient?
- a) N
 - b) B
 - c) Zn
 - d) Ca
 - e) Mn
- 47) If a plant exhibits overall chlorosis of the older leaves, which nutrient is likely deficient?
- a) Mo
 - b) N
 - c) Mn
 - d) K
 - e) Mg
- 48) Which of the following can be both a Mg and a Ca fertilizer?
- a) urea
 - b) Epsom salt
 - c) gypsum
 - d) superphosphate
 - e) dolomite
- 49) Which of the following CANNOT be applied as a chelate?
- a) Fe
 - b) Mn
 - c) Cu
 - d) B
 - e) Zn
- 50) Which of the following is the source of C for plants?
- a) carbon dioxide
 - b) water
 - c) oxygen
 - d) air pollution
 - e) soil mineral particles

NAME _____ SIGNATURE _____

HORT 201 - 3rd EXAM (f01)

Carefully mark answers on the scantron. Only answers marked on the scantron will be graded.

- 1) _____ is the amount of water vapor in the air, expressed as a percentage of the amount of water vapor that could be held at saturation.
 - a) specific humidity
 - b) vapor pressure
 - c) absolute humidity
 - d) barometric pressure
 - e) relative humidity

- 2) As warm moist air rises its temperature decreases with increasing altitude and its relative humidity _____; when the rising air reaches its dew point, water condenses into small water droplets that stay suspended high in the atmosphere forming _____.
 - a) decreases / fog
 - b) increases / dew
 - c) decreases / clouds
 - d) increases / clouds

- 3) What type of precipitation occurs if water condenses in the upper atmosphere when both the air temperature and the dew point are below freezing?
 - a) snow
 - b) rain
 - c) hail
 - d) sleet
 - e) mist

- 4) The loss of water from leaves is called _____.
 - a) condensation
 - b) evaporation
 - c) precipitation
 - d) evapotranspiration
 - e) transpiration

- 5) The cycling of water through the earth's environment between the atmosphere, the earth's surface and the earth's subsurface is called the _____.
 - a) evapotranspiration cycle
 - b) evaporation cycle
 - c) condensation cycle
 - d) hydrologic cycle
 - e) nitrogen cycle

- 6) In woody stems, most of the water is translocated in the _____.
 - a) phloem
 - b) sap wood
 - c) veins
 - d) heart wood
 - e) endodermis

- 7) Most of the water lost by leaves occurs through the _____.
 - a) epidermis
 - b) cuticle
 - c) lenticels
 - d) hydathodes
 - e) stomata

- 8) The secretion of liquid water by leaves is called _____.
 - a) guttation
 - b) transpiration
 - c) translocation
 - d) secretion
 - e) there is no correct answer because plants never secrete liquid water

- 9) Which of the following IS NOT a reason why most of the water absorbed by roots occurs through root hairs?
- a) they are numerous
 - b) they are rapidly produced
 - c) they have a large total surface area
 - d) they are constantly produced
 - e) all are reasons why root hairs absorb most of the water
- 10) Water moves by osmosis from the soil and into the roots, which causes a positive pressure in the roots. This positive pressure in the roots is the driving force for translocation of water up from the roots through the stems and into the leaves.
- a) true
 - b) false
- 11) If you were going to develop a new plant species through plant breeding that had minimum transpiration so it could live in drier environments, then which of the following plant characteristics would you NOT select for?
- a) hairy leaves
 - b) waxy leaves
 - c) small leaves
 - d) horizontally oriented leaves
 - e) all decrease transpiration and should be selected for
- 12) As relative humidity increases, transpiration _____.
- a) decreases
 - b) increases
- 13) Chemicals that can be sprayed on leaves to decrease transpiration are called _____.
- a) antitranslocatants
 - b) antidesiccants
 - c) antiperspirants
 - d) surfactants
 - e) antitranspirants
- 14) Cranberry orchards often are irrigated by flood irrigation. During the winter, the flood irrigation can also be used for frost protection.
- a) true
 - b) false
- 15) Which of the following is a disadvantage of sprinkler irrigation?
- a) can automate and irrigate sections
 - b) can be used for evaporative cooling
 - c) can be used for frost protection
 - d) causes more foliar disease
 - e) none are disadvantages, they are all advantages
- 16) Which of the following greenhouse irrigation systems places the pots on an absorbent material and water is drawn up through holes in the bottom of the pot?
- a) sprinkler
 - b) capillary mat
 - c) chapin (spaghetti) tube
 - d) diaper system
 - e) wick system
- 17) A good, rich, loam field soil is excellent to use as a potting soil for growing plants in containers.
- a) true
 - b) false
- 18) The most fertile horizon in the soil is the _____ horizon.
- a) A
 - b) B
 - c) C
 - d) D
 - e) E
- 19) If you determine that the soil in your garden has 2% organic matter, then which soil type do you have?
- a) muck
 - b) peat
 - c) mineral
 - d) organic

- 44) Epsom salt can be used as a _____ fertilizer.
- a) Ca
 - b) N
 - c) Mn
 - d) Mg
 - e) B
- 45) Urea can be used as a _____ fertilizer.
- a) P
 - b) B
 - c) Mg
 - d) N
 - e) Ca
- 46) _____ is the conversion of N in organic matter to ammonium.
- a) nitrification
 - b) ammonification
 - c) denitrification
 - d) nitrogen fixation
- 47) The bacterium in the soil that converts nitrite to nitrate is called _____.
- a) Nitrosomonas
 - b) Anabaena
 - c) Nitrobacter
 - d) Clostridium
 - e) Azolla
- 48) Straw has a high C:N ratio, and if you incorporate straw into your garden it will _____ the soil N.
- a) increase
 - b) decrease
- 49) Which of the following microorganisms forms a symbiotic relationship with legumes, such as soybean, and fixes atmospheric nitrogen.
- a) Azotobacter
 - b) Rhizobium
 - c) Anabaena
 - d) Nitrosomonas
 - e) Actinomycetes
- 50) Macronutrients are needed by plants from 0.2-6% of their dry weight, whereas micronutrients are needed by plants from 1-300 ppm (0.0001-0.003%) of their dry weight. Therefore, macronutrients are more important to the nutrition of plants than micronutrients.
- a) true
 - b) false

NAME _____ SIGNATURE _____

HORT 201 – 3rd EXAM – (f00)

Carefully mark answers on the scantron. Only answers marked on the scantron will be graded.

- 1) Herbaceous plants are _____ water.
 - a) 45-55%
 - b) 55-65%
 - c) 65-75%
 - d) 75-85%
 - e) 85-95%
- 2) If an individual cell loses water, its turgor pressure goes down, it becomes flaccid, and it shrinks in size. This is called _____.
 - a) plasmolysis
 - b) deflation
 - c) lysis
 - d) ungrowth
 - e) wilting
- 3) _____ is the amount of water vapor in air expressed as grams of water per kilogram of air (g/kg).
 - a) relative humidity
 - b) absolute humidity
 - c) dew point
 - d) specific humidity
 - e) vapor pressure
- 4) What type of precipitation occurs if condensation occurs at temperatures above freezing in the upper atmosphere and the condensate falls directly to the ground?
 - a) sleet or hail
 - b) snow
 - c) rain or drizzle
 - d) dew
 - e) fog
- 5) In the hydrologic cycle, how is water returned back to the atmosphere in vapor form?
 - a) precipitation
 - b) evapotranspiration
 - c) vaporization
 - d) condensation
 - e) run-off
- 6) Aquifers are very important sources of water for many areas of the country.
 - a) true
 - b) false, the water is too difficult to get out
- 7) In plants, if one followed the flow of water into the roots, through the stems, into the leaves, then out of the leaves, which of the following would NOT be a major part of the pathway?
 - a) root hair
 - b) suberized endodermis
 - c) sapwood
 - d) xylem of veins in leaf
 - e) stomata
- 8) During guttation, the liquid water is lost through structures called _____.
 - a) stomata
 - b) lenticels
 - c) plasmodesmata
 - d) hydathodes
 - e) cuticles
- 9) In the Cohesion Theory of translocation, what is the driving force that allows translocation to occur?
 - a) absorption
 - b) osmosis
 - c) turgor pressure
 - d) transpiration
 - e) vapor pressure
- 10) A leaf that is vertically orientated will have a lower transpiration rate than a leaf that is horizontally orientated.
 - a) true
 - b) false

- 20) Place the soil mineral particles in order, from largest to smallest in size.
- a) clay > silt > sand
 - b) sand > silt > clay
 - c) clay > sand > silt
 - d) sand > clay > silt
 - e) silt > sand > clay
- 21) Which type of soil contains the highest content of organic matter?
- a) peat
 - b) muck
 - c) mineral
 - d) humoid
 - e) sodic
- 22) A high percent base saturation means that the soil contains a high level of mineral nutrients attached to the cation exchange capacity (CEC) and that it will have a high level of fertility, assuming the CEC is high enough.
- a) true
 - b) false
- 23) Continually adding _____ to a soil through the use of poor quality irrigation water will tend to cause the soil to _____.
- a) Na / flocculate
 - b) Ca / deflocculate
 - c) Na / deflocculate
 - d) N / deflocculate
 - e) K / flocculate
- 24) Which of the following is the definition of cation exchange capacity (CEC)?
- a) negative log of H ion concentration
 - b) % of nutrients as basic nutrients
 - c) milliequivalents per 100 g soil
 - d) % organic matter
 - e) pounds cations per acre
- 25) Which soil particle contributes the most to the drainage of a mineral soil?
- a) silt
 - b) sand
 - c) clay
- 26) Basic soils usually occur in areas of _____.
- a) lower rainfall
 - b) higher rainfall
- 27) If you have your garden soil tested and it reveals that your soil pH is too high, which of the following could you add to decrease the soil pH?
- a) dolomite
 - b) a high nitrate fertilizer
 - c) gypsum
 - d) a chelate fertilizer
 - e) elemental sulfur
- 28) A _____ has a pH of 8.5-10, low to moderate salts, but 15% or more of the CEC (cation exchange capacity) is occupied by Na.
- a) saline soil
 - b) loam soil
 - c) sodic soil
 - d) saline-sodic soil
 - e) muck soil
- 29) If you use field soil (e.g. a mineral soil) to fill your containers to grow your house plants, the drainage will be _____.
- a) increased and acceptable
 - b) decreased and unacceptable
 - c) stay the same, and thus the plants will live happily ever after
- 30) Which is the best type of peat moss to use to make growing media?
- a) composted peat
 - b) muck peat
 - c) domestic peat
 - d) sphagnum peat
 - e) Texas peat

- 31) Which form of soil moisture is the most important in supplying the water that plants use?
- a) hygroscopic water
 - b) gravitational water
 - c) chemically combined water
 - d) capillary water
 - e) Perrier water
- 32) _____ is the soil moisture content when a plant wilts, but cannot recover when placed in a saturated atmosphere.
- a) permanent wilting
 - b) incipient wilting
 - c) permanent wilting point
 - d) incipient wilting point
 - e) terminal wilting point
- 33) What is the name of the instrument that can be inserted into the soil to measure the soil moisture tension so you know when to irrigate?
- a) photometer
 - b) solenoid
 - c) quantum sensor
 - d) moistometer
 - e) tensiometer
- 34) If I wanted to mulch my garden with plastic, which would be the best to use during the summer to keep the soil under the mulch the coolest?
- a) clear plastic
 - b) black plastic
 - c) neither, both get too hot so plastic mulches should never be used
- 35) Which of the following nutrients is a micronutrient?
- a) Cu
 - b) S
 - c) Mg
 - d) Ca
 - e) N
- 36) Which of the following nutrients is mobile?
- a) Zn
 - b) B
 - c) Mg
 - d) Fe
 - e) Cu
- 37) Which of the following nutrients is more available in the high pH soils of west Texas?
- a) Mn
 - b) Mo
 - c) B
 - d) Cu
 - e) Fe
- 38) I called Producers Coop and they have a 50 pound bag of 13-13-13 fertilizer for \$9.20 and a 50 pound bag of 10-20-10 fertilizer for \$8.95. Which is the “best” or “most economical” purchase (when considering only the nutrient content)?
- a) the 13-13-13 fertilizer
 - b) the 10-20-10 fertilizer
 - c) they are both equal in value
- 39) What type of growth would be favored by a fertilizer with a ratio of 6-18-12?
- a) flowering
 - b) vegetative growth
 - c) neither would be favored, both vegetative growth and flowering would be good
- 40) In the nitrogen cycle, what is the conversion of ammonium to nitrate is called?
- a) nitrogen fixation
 - b) denitrification
 - c) ammonification
 - d) chelation
 - e) nitrification

- 41) A recycling business in town sells composted garbage. It has a pretty low C:N ratio. Therefore, if you tilled it into your flower beds, it would _____.
- a) use up the nitrogen in the soil, thus cause a nitrogen deficiency
 - b) release nitrogen to the soil, thus act as an organic fertilizer
- 42) Which of the following IS NOT a nitrogen-fixing microorganism?
- a) Rhizobium
 - b) Clostridium
 - c) Anabaena
 - d) Nitrosomonas
 - e) some Actinomycetes
- 43) Which of the following nutrients is needed by plants in the largest quantities?
- a) Fe
 - b) Mn
 - c) B
 - d) Mo
 - e) S
- 44) Which of the following nutrients is involved with either amino acids, proteins or enzymes?
- a) Ca
 - b) P
 - c) Na
 - d) Cu
 - e) B
- 45) A deficiency of which nutrient causes the new leaves to be thick and brittle, and appear somewhat succulent?
- a) B
 - b) P
 - c) Fe
 - d) Zn
 - e) Mo
- 46) A deficiency of which nutrient causes the plant to appear deeper green, which may make it appear healthy, but it does not grow much (the petioles may also become purple)?
- a) N
 - b) P
 - c) B
 - d) K
 - e) S
- 47) Which of the following compounds is a sulfur fertilizer?
- a) superphosphate
 - b) Epsom salt
 - c) gypsum
 - d) potassium sulfate
 - e) all are sulfur fertilizers
- 48) Ammonium is a _____ fertilizer.
- a) C
 - b) Mo
 - c) N
 - d) S
 - e) Ca
- 49) What term is used to describe yellowing of leaves?
- a) jaundice
 - b) chlorosis
 - c) yellowtosis
 - d) necrosis
 - e) pigmentosis
- 50) A positively charged fertilizer salt is called a/an _____?
- a) neutron
 - b) anion
 - c) positron
 - d) electron
 - e) cation