

Grower Training Manual, Ohio Certified Nursery Technician (OCNT) Chapter 1 – Basic Principles of Plant Growth and Development

1. What is the function of the vascular cambium, xylem and phloem?
 - A. To transport water and nutrients throughout the tree
 - B. System in which plant transpires
 - C. Transports chlorophyll from leave to roots
 - D. Where the plant houses the nutrients
2. How does transpiration benefit the plant?
 - A. Excessive transpiration will cause leaves to wilt
 - B. As it loses water it pulls nutrients into the roots
 - C. Causes the leaves to absorb more sunlight
 - D. Reduces compaction in the soil
3. What is the purpose of photosynthesis?
 - A. Controls the upward movement of nutrients in the plant
 - B. Increases oxygen in the soil
 - C. Process of storing food for the plant
 - D. Produces food for the plant
4. Why do roots need oxygen in the soil?
 - A. Aids in fruit development
 - B. Allows for better transpiration in the roots
 - C. Gives the roots more sunlight thus aiding them in photosynthesis
 - D. To aid in respiration process
5. Environmental factors affect what basic plant processes?
 - A. Respiration
 - B. Transpiration
 - C. Photosynthesis
 - D. All of the above
6. How does girdling kill a tree?
 - A. Reduces the amount of light the tree lets in
 - B. Affects the tress transpiration process
 - C. It does not allow water to get to the roots
 - D. Disrupting to movement of food from leaves to roots
7. Why is it harder to transplant tap rooted plants?
 - A. Taproots have larger cluster of roots
 - B. Taproots have fewer overall roots
 - C. Taproots need more water
 - D. None of the answers above
8. The function of meristem tissue is to stay nonspecialized and retain the capacity for rapid cell division.
 - A. True
 - B. False

9. Under what circumstances might a zone 4 plant be killed in a zone 5?
- A. Was not able to tolerate the increased precipitation in zone 5
 - B. The plant did not go through the acclimation process
 - C. It could not tolerate the colder temperature of zone 5
 - D. Plant was not able to tolerate the temperatures produces on the north side of the building
10. What are the primary life cycles of plants?
- A. Annual
 - B. Triannual
 - C. Perennial
 - D. Both A and C
11. What is the difference between herbaceous and woody perennials?
- A. Woody perennials regrow from stems, herbaceous regrow from hardy root systems
 - B. Herbaceous perennials regrow from seeds every year, woody perennials regrow from stems.
 - C. Herbaceous perennials must be replanted every year, woody perennials regrow from stems.
 - D. Woody perennials hold their leaves throughout the winter, herbaceous perennials lose their leaves.
12. What is photoperiodism?
- A. Process of water uptake
 - B. Processes the plant uses to create food
 - C. Plants response to the amount of light plant receives daily
 - D. Process of water loss
13. The process by which a plant stops active growth and develops the capacity to survive freezing temperatures is?
- A. Cold acclimation
 - B. Warm acclimation
 - C. Drought
 - D. Deep freeze
14. What element is important in the production of chlorophyll in the leaf?
- A. Mercury
 - B. Iron
 - C. Zinc
 - D. Nitrogen

15. In the process of _____, the leaf uses energy from sunlight to fix carbon dioxide from the atmosphere and water into sugars.
- A. Respiration
 - B. Transpiration
 - C. Photosynthesis
 - D. Pollination
16. Tissues that conduct various substances in liquid form are _____.
- A. Vascular
 - B. Xylem
 - C. Circular
 - D. Phloem
17. Plant are anchored to the soil by the _____.
- A. Stems
 - B. Leaves
 - C. Roots
 - D. Rocks
18. Which of the following are considered modified underground stems?
- A. Seeds
 - B. Roots
 - C. Bulbs
 - D. None of these
19. Phosphorus acids are in which of the following?
- A. Root establishment
 - B. Leaf shape
 - C. Leaf color
 - D. Growth regulation
20. The uptake of water and dissolved minerals is an important consequence of transpiration.
- A. True
 - B. False
21. Production of food is the primary function of the leaf.
- A. True
 - B. False
22. All cells within the phloem are nonliving.
- A. True
 - B. False
23. Plant Respiration is _____.
- A. Loss of moisture from the plant
 - B. Breakdown of sugars using oxygen; giving off carbon dioxide
 - C. Creation of sugars using carbon dioxide; giving off oxygen
 - D. Plants with bad breath

24. What opens and closes the stoma on the leaves

- A. Epidermis cells
- B. Guard cells
- C. Mesophyll cells
- D. Hinge cells

25. What types of plants contain cambium?

- A. Dicots
- B. Monocots
- C. Fungi
- D. Lichen

Grower Training Manual, Ohio Certified Nursery Technician (OCNT) Chapter 2 – The Naming of Plants

1. There are _____ kingdoms of living organisms.
 - A. 1
 - B. 7
 - C. 3
 - D. 5
2. A family is a group of related _____.
 - A. Orders
 - B. Classes
 - C. Genera
 - D. Divisions
3. Crabapple is in the _____ family.
 - A. Cacti
 - B. Rose
 - C. Buttercup
 - D. Purslane
4. Which of the following is a plant species?
 - A. Pyrus
 - B. Calleryana
 - C. Pyrus Calleryana
 - D. Rosacea
5. Plant patents last for _____.
 - A. 10 years
 - B. 17 years
 - C. 20 years
 - D. 25 years
6. Federal trademark registration is good for _____.
 - A. 5 years
 - B. 10 years
 - C. 17 years
 - D. Indefinitely
7. When used in print, the first letter of the genus is not capitalized. The first letter of the specific epithet is generally capitalized.
 - A. True
 - B. False
8. Plant patents are renewable.
 - A. True
 - B. False

9. Who is credited with the Latin binomial system of naming plants?
- A. Socrates
 - B. Linnaeus
 - C. Liberace
 - D. Aristotle
10. Why is the Latin language used for naming plants?
- A. It is universally used, non-changing language
 - B. It is recognized world-wide
 - C. It helps avoid errors in classification
 - D. All of the above
11. Which of the following is correct according to the International Code of Botanical Nomenclature?
- A. Acer Rubrum October Glory
 - B. acer rubrum 'October Glory'
 - C. Acer rubrum 'October Glory'
 - D. Acer rubrum 'October Glory'

Grower Training Manual, Ohio Certified Nursery Technician (OCNT)
Chapter 3 – Propagation by Stem Cuttings

1. The process where a plant's stems become woody as they mature is called _____?
 - A. Grafting
 - B. Hardening
 - C. Propagation
 - D. Scarification
2. The method of producing plants from any of the vegetative organs of a single parent is called _____ propagation?
 - A. Asexual
 - B. Sexual
 - C. Deciduous
 - D. Fertilization
3. The process of inserting a stem cutting into a moist, porous growing medium is called _____?
 - A. Budding
 - B. Dividing
 - C. Grafting
 - D. Sticking
 - E. Scarification
4. The irregular mass of cells that form at the base of cutting is called _____.
 - A. Asexual
 - B. Callus
 - C. Clone
 - D. Scab
5. Hardwood cuttings are taken during the _____ season?
 - A. Dormant
 - B. Fall
 - C. Spring
 - D. Summer
6. This propagation method is most commonly used by the forestry and Christmas tree industries.
 - A. Cutting
 - B. Grafting
 - C. Indoor seeding
 - D. Outdoor seeding
7. What seasons are most common for outdoor nursery crop seeding?
 - A. Autumn and Winter
 - B. Autumn and Spring
 - C. Spring and Summer
 - D. Summer and Autumn

8. The process of storing seed in cool moist conditions to overcome seed dormancy.
 - A. Fertilization
 - B. Germination
 - C. Scarification
 - D. Stratification

9. The process of breaking the seed coat to promote seed germination.
 - A. Fertilization
 - B. Germination
 - C. Scarification
 - D. Stratification

10. A characteristic of direct outdoor seed propagation.
 - A. Low cost
 - B. Weather dependent
 - C. Genetic variability
 - D. All of the above
 - E. None of the above

Grower Training Manual, Ohio Certified Nursery Technician (OCNT)
Chapter 4 – Outdoor Seed Propagation

1. Separation of a single plant and potting each separated piece is called _____.
 - A. Air layering
 - B. Division
 - C. Leaf cutting
 - D. Stem cutting
2. A good growing medium for house plants must meet several requirements; these are _____.
 - A. WHC; sufficient soil air; good drainage
 - B. Good Drainage and WHC
 - C. pH 5.0-6.0; WHC; sufficient soil air; good drainage; freedom from weed seed
 - D. Must be sterile; weed seed free; a combination of peat, perlite, and vermiculite; pH of 7.1-7.5
3. Adding clay to commercial potting soil will _____ the drainage of the medium
 - A. Increase
 - B. Not change
 - C. Decrease
 - D. Improve
4. What type of pot is recommended to most house plant enthusiasts?
 - A. Plastic
 - B. Clay
 - C. Metal
 - D. Ceramic
5. When repotting a new plant, you should plant at the same depth that it grew originally, leaving at least _____ of space between the soil line and the top of the pot.
 - A. ¼ inch
 - B. ½ inch
 - C. ¾ inch
 - D. 1 inch
6. The primary problem in growing houseplants is _____.
 - A. Disease
 - B. Pests
 - C. Over watering
 - D. Environment
7. Houseplant fertilizers are normally a _____ ratio.
 - A. 0-0-6
 - B. 12-12-12
 - C. 1-1-1
 - D. 5-10-5

8. Fertilizing can cause the build-up of _____ in the soil.
- A. Lime
 - B. pH
 - C. Soluble salts
 - D. Sulfur
9. In general, high light plants require _____ foot candles of light per day.
- A. 1000-5000
 - B. 3000-5000
 - C. 5000-8000
 - D. 8000-10,000
10. In general, lower light plants require _____ foot candles of light per day.
- A. 100-500
 - B. 500-1000
 - C. 1000-5000
 - D. 5000-7000
11. Some plants will survive with as little as 50-foot candles of light, if illuminated _____ hours of more with artificial light.
- A. 5
 - B. 10
 - C. 12
 - D. 16
12. Which windows in a home receive no direct sun?
- A. East
 - B. West
 - C. North
 - D. South
13. Which windows in a home receive the most sunlight?
- A. East
 - B. West
 - C. North
 - D. South
14. As a general rule, most houseplants respond best to temperatures ranging from ____ to ____ degrees Fahrenheit.
- A. 70-75
 - B. 55-75
 - C. 65-75
 - D. 60-70
15. Most house plants prefer a night time temperature ____ to ____ degrees cooler than daytime temperatures.
- A. 5-10
 - B. 0-5
 - C. 10-15
 - D. No change

16. High relative humidity is an environmental condition _____.
- A. Not preferred by most plants
 - B. That is best avoided for good growth and foliage of the house plants
 - C. Preferred by most house plants
 - D. That cause diseases on house plants
17. A good growing medium for houseplants needs which of the following?
- A. Sufficient Soil Air
 - B. Good Drainage
 - C. Water holding capacity
 - D. All of the above
18. When transplanting from one container to the next bigger size container you should leave at least _____ of space between the top of the pot and the soil line.
- A. 1 inch
 - B. 1 ½ inches
 - C. 2 inches
 - D. 2 ½ inches
19. Variegated plants require _____ light than all-green plants.
- A. Less
 - B. More
 - C. The same amount of
 - D. None of the above

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Chapter 5 – Grafting of Woody Plants

1. What is root stock?
 - A. Plants that are normally avoided in the grafting process
 - B. The host root system of a newly grafted plant
 - C. Primarily composed of taproots
 - D. None of the above

2. When grafting compatibility is the ability of the scion and the rootstock to divide at the graft union and survive as two plants
 - A. True
 - B. False

3. When grafting, what cell layer is most important and should “line up and match”?
 - A. Heartwood/Pith
 - B. Xylem
 - C. Cambium
 - D. Phloem

4. A graft union that looks like a long Z is known as root grafting
 - A. True
 - B. False

5. _____ is a process of combining a dormant scion onto a root section of a desired root stock. Matching cuts 2” in length are made on both scion and root stock
 - A. Whip and tongue
 - B. Root grafting
 - C. Side veneer grafting
 - D. None of the above

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Chapter 6 – Development of Deciduous Tree Liners Through Field Budding Techniques

1. Stem growth collected from a tree cultivar to be propagated
 - A. Chip
 - B. Cutting
 - C. Budwood
 - D. Rootstock

2. A grafting technique where the scion consists of a single meristem.
 - A. Budding
 - B. Disbudding
 - C. Pruning
 - D. Scion

3. This specialized pruning technique is extremely important in the production of budded tree liners.
 - A. Budding
 - B. Disbudding
 - C. Scion
 - D. None of the above

4. A two-year-old plant that is transplanted in the field or a container to be grown to a marketable size.
 - A. Budwood
 - B. Liner
 - C. Rootstock
 - D. Scion

5. This is the best tool for field budding tree liners.
 - A. Ax
 - B. Knife
 - C. Saw
 - D. Shear

6. A sharp tool is safer to use than a dull one.
 - A. True
 - B. False

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Chapter 7 – Field Production of Narrowleaf Evergreen Trees

1. Narrowleaf evergreen trees grow best in wet bottom land soils.
 - A. True
 - B. False
2. Which of the following would be considered to be the “logistics” in field production of narrowleaf evergreen trees?
 - A. Water source, quantity/quality
 - B. Vehicle access
 - C. Convenient location for harvesting equipment access to field
 - D. All of the above
3. In grading narrowleaf evergreen trees, they are graded by two numbers (ex. 2-2). These numbers mean: 2 years seed bed and 2 years transplant bed.
 - A. True
 - B. False
4. The term “plug plus one” hemlock is less than _____ years old.
 - A. 1
 - B. 2
 - C. 3
 - D. 4
5. The most notable problem in the production of narrowleaf evergreen trees is insects.
 - A. True
 - B. False
6. White pine grown for Christmas trees requires tight sheering during production.
 - A. True
 - B. False

Grower Training Manual, Ohio Certified Nursery Technician (OCNT)
Chapter 8 – Deciduous Shrub Production

1. Softwood cutting is the primary propagation technique used in deciduous shrub production.
 - A. True
 - B. False

2. A pH of _____ is preferred in the production of deciduous shrubs
 - A. 5.0 – 6.0
 - B. 6.0 – 6.5
 - C. 6.5 – 7.0
 - D. 7.0 – 7.5

3. In the second year of production of deciduous shrubs, they are pruned _____.
 - A. Once
 - B. Twice
 - C. Three times
 - D. Not at all

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Chapter 9 – Marketing and Field Production of Shade and Ornamental Trees

1. What are the two basic markets considered when identifying plant material?
 - A. Production markets
 - B. Retail markets
 - C. Design build market
 - D. Both B and C

2. The design-build market typically desires trees with a _____ inch caliper.
 - A. 1 - 1 ½ inches
 - B. 2 - 2 ½ inches
 - C. 2 ½ - 4 inches
 - D. 3 - 3 ½ inches

3. January and February are the two months of the year that wholesale nurseries usually receive bare root tree liners from west coast suppliers.
 - A. True
 - B. False

Grower Training Manual, Ohio Certified Nursery Technician (OCNT)
Chapter 10 – Growing Nursery Stock in Containers

1. The fact that plants grown in containers are placed above ground and must be monitored for water and nutrient needs is considered to be a disadvantage of growing containerized plants.
 - A. True
 - B. False
2. Growing plants in containers allows for _____.
 - A. Spacing advantages
 - B. Unlimited selling season
 - C. Required less space than ball and burlap stock
 - D. All of the above
3. _____ refers to the placement of container plants on the growing pad or standing ground according to immediate needs.
 - A. Categorization
 - B. Stocking
 - C. Placement
 - D. Staging
4. Spacing does not affect the future growth of containerized plants.
 - A. True
 - B. False
5. Spacing patterns are usually rectangular or diagonal.
 - A. True
 - B. False
6. Many plastic container styles have a rim at the top denote the _____.
 - A. Water filling point
 - B. Design to trademark of company
 - C. Media fill line
 - D. Nothing – only pot design
7. When watering plants in containers, you should _____.
 - A. Fill to surface of pot rim
 - B. Fill once when drained, re-water again
 - C. Water very lightly, not filling to the rim
 - D. Leech with water three times per watering
8. When growing plants in containers in a nursery, you should always use a soil-less media.
 - A. True
 - B. False

9. The most common form of protection for containerized plants for over-wintering is _____.
- A. Greenhouse (heated)
 - B. Burying pots in ground or mulch
 - C. Unheated polyhouse
 - D. Heeling pots into a field bed
10. A problem created by the sun in polyhouses in the winter is _____.
- A. Excessive heat builds up
 - B. Drying of soil media
 - C. Promoted growth of molds
 - D. All of the above
11. Overwintering polyhouses for containers do not require venting on sunny days.
- A. True
 - B. False
12. Prevention spray of fungicides is an essential treatment to use on containers just prior to storage in polyhouse.
- A. True
 - B. False

Grower Training Manual, Ohio Certified Nursery Technician (OCNT)
Chapter 11 – An Overview of the Production of Herbaceous Perennials and
Annuals Groundcovers and Vines

1. The term “plugs” refers to _____.
 - A. Used to seal drain holes in containers
 - B. Pre-grown seedlings
 - C. A horticulturist who seeds and transplants
 - D. Peat pots
2. Propagation of perennials is usually done _____.
 - A. In summer
 - B. The year before it is to be sold
 - C. Early spring
 - D. Late winter
3. Smaller container sizes (ex. 4”, 1 qt., 1 gal.) are used for _____.
 - A. Garden center sales
 - B. Landscape contractors
 - C. Drinking containers
 - D. None of above
4. Field mineral soils usually are not used as a container media because of drainage problems that can occur.
 - A. True
 - B. False
5. The structureless thermal blanket technique is used primarily to _____.
 - A. Protect containers from frost during early spring.
 - B. Overwinter perennials in containers.
 - C. Overlay pots on tables to retain moisture in the winter.
 - D. Wrap young trees for winter protection from the wind
6. When overwintering perennials, botrytis is not necessary since plants are dormant.
 - A. True
 - B. False
7. Once you have uncovered overwintered perennials you should not recover them, even if cold temperature return.
 - A. True
 - B. False
8. Polyphosphate is used as a _____.
 - A. Fertilizer
 - B. Additive to water to rinse iron buildup of foliage
 - C. Bloom increasing fertilizer
 - D. Polyhut covering

9. Good cultural practices help maintain plant vigor.
- A. True
 - B. False
10. This pathogen causes seedlings to be girdled at the media surface.
- A. Botyris
 - B. Pythium
 - C. Anthraconose
 - D. Rhizonctonia
11. Botyris often appears on foliage and stems during overwintering of herbaceous perennials.
- A. True
 - B. False
12. Pesticides in general are not phototoxic, therefore they will have no effect if applied to a crop on a sunny day.
- A. True
 - B. False
13. Pesticides may be applied to a blooming crop without causing damage to the flowers.
- A. True
 - B. False
14. This insect is one of the most common to herbaceous perennials. It is a plant lice that is 1/6 to 1/8 inches long, yellowish-green to black in color, and often found in clusters near elongated shoots.
- A. Thrips
 - B. Scale
 - C. Aphids
 - D. Spider mites
15. _____ are slender, wedge-shaped insects that are usually green, yellow, brown and are about ¼ of an inch in length. The sucking injury of this insect is a characteristic of a white dotted effect on the leaf surface followed by a yellowing or eventual browning.
- A. Aphids
 - B. Thrips
 - C. Leafhoppers
 - D. Spider mites
16. Spider mites are particularly troublesome in hot dry weather.
- A. True
 - B. False
17. Chrysanthemum and Columbine are two species that are particularly susceptible to _____.
- A. Anthracnose
 - B. Leaf miners
 - C. Spider mites
 - D. Leafhoppers

18. _____ are insects 1/20 of an inch long. They suck sap from leaves and buds. Symptoms include flowers partially open and silver streaked foliage.

- A. Aphids
- B. Thrips
- C. Leaf miners
- D. Leafhoppers

Grower Training Manual, Ohio Certified Nursery Technician (OCNT)
Chapter 12 – Field and Container Production of Herbaceous Perennials

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2. A problem created by the sun in polyhouses in the winter is _____.
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 - B. False
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9. This insect is one of the most common to herbaceous perennials. It is a plant lice that is 1/6 to 1/8 inches long, yellowish-green to black in color, and often found in clusters near elongated shoots.
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Chapter 13 – Ball and Burlap Harvesting Techniques

1. Harvesting of ball and burlap plants can have effects on the plants' growth in the landscape.
 - A. True
 - B. False
2. Ball and burlap stock must be labeled with correct nomenclature and size classification
 - A. True
 - B. False
3. Ball and burlap plants should not have their branches and/or limbs bound until they are ready to be shipped to the merchant
 - A. True
 - B. False
4. The American standards of nursery stock is published by _____.
 - A. The International Code of Botanical Varieties
 - B. The US Department of Agriculture
 - C. The American Association of Nurserymen
 - D. The Ohio Nursery and Landscape Association
5. Misshapen or irregular trunks on ball and burlap plants will require an adjustment in sizing the ball to be harvested.
 - A. True
 - B. False
6. The size of the earth ball on ball and burlap plants is determined by the size of the plants. Species does not affect ball size.
 - A. True
 - B. False
7. The shape of the earth ball on ball and burlap plants does not determine how well it holds together. Only firmness determines this factor.
 - A. True
 - B. False
8. If an earth ball begins to break apart when the ball and burlap stock, it is lost and cannot be saved. It must be heeled into the ground and left for future harvest.
 - A. True
 - B. False
9. Plastic twine and nylon are the most twines used in securing earth balls on the ball and burlap stock.
 - A. True
 - B. False

Grower Training Manual, Ohio Certified Nursery Technician (OCNT)
Chapter 14 – Greenhouse Construction and Environmental Control

1. When selecting a plot for a greenhouse, climate is a factor in this process. A site should be selected where sunlight and temperature are best suited for crops to be grown.
 - A. True
 - B. False
2. What is the most common fuel for a greenhouse heating source?
 - A. Diesel
 - B. Unleaded Gas
 - C. Coal
 - D. Natural Gas
3. The pH level of the water supply for a greenhouse should be _____?
 - A. 5.0 – 6.0
 - B. 5.5 – 6.0
 - C. 6.0 – 6.5
 - D. 6.5 – 7.0
4. Most greenhouse framework today is made of what?
 - A. Aluminum
 - B. Steel
 - C. Iron
 - D. Bronze
5. If your greenhouse is located above the fortieth parallel (Columbus, OH) it does not matter whether it orients north, south, east, or west.
 - A. True
 - B. False
6. The least expensive glazing material is?
 - A. Glass
 - B. Polycarbonate
 - C. Acrylic
 - D. Polyethylene
7. Fan-jet systems is _____.
 - A. Used for reducing greenhouse temperatures
 - B. Used for irrigation to combat against diseases
 - C. Used for reducing the amount of insects
 - D. Used for drying off plants
8. What is an issue with carbon dioxide levels that a tight greenhouse could create?
 - A. It had not effect on plants
 - B. The CO₂ levels become too high
 - C. The CO₂ levels fall too low
 - D. None of the above

9. What could low light intensity levels be caused by?

- A. Glazing material
- B. Gutters
- C. Hanging baskets
- D. All of the above

10. Night break lighting is the interruption of the dark period in the summer months

- A. True
- B. False

Grower Training Manual, Ohio Certified Nursery Technician (OCNT) Chapter 15 – Overwintering Nursery Plants

1. What does the USDA Plant Hardiness Zone Map show?
 - A. Designates the average annual minimum temperatures
 - B. Designates degree days and thermal units
 - C. Reflects local micro climates
 - D. Designed for the needs of containerized plants
2. Desiccation is a problem in overwintering nursery stock, especially evergreens it refers to?
 - A. Cold hardiness of stems
 - B. Heat tolerance of flower buds
 - C. Damage caused by plant water loss in excess of uptake by the roots
 - D. Sunscald on small branches
3. Woody plants become acclimated or hardy due to?
 - A. Changes in temperature
 - B. Photoperiod changes
 - C. Freezing temperatures
 - D. All of the above
4. When overwintering plants, it is important to use a system that?
 - A. Protects roots from excessive cold temperature
 - B. Protect leaves and stems from excess water loss
 - C. Must be economical and manageable
 - D. All of the above
5. Which of these is not an adequate overwintering system for northern Ohio nursery plants?
 - A. Polyhuts with plants safely away from the outside edges
 - B. Plants consolidate and surrounded by straw
 - C. Polyhouse with supplement heat
 - D. Plants consolidated and covered with thermal blanket and ploy
6. The most expensive overwintering system which is the only methods that offers 100% protection against low temperature injuries is which of the following?
 - A. Plants consolidated and covered with thermal blanket
 - B. No plant covering with continuously heated polyhouse
 - C. Unheated polyhuts
 - D. No plant covering with polyhouse
7. To provide the best cold weather protection, when should you cover containerized nurse stock?
 - A. Before fall leaf drop
 - B. After first hard freeze and leaf drop
 - C. Before first light frost
 - D. After series of hard freezes

8. In containerized nursery stock, the plant part often vulnerable to winter cold, often much more tender than the plant hardiness zone for that plant would indicate is?
- A. Leaves
 - B. Stem
 - C. Bark
 - D. Roots
9. Fruit trees are especially prone to flower bud damage in which of these seasons?
- A. Spring
 - B. Summer
 - C. Winter
 - D. Fall
10. When acclimating plants for storage over winter we should do which of the following?
- A. Avoid late summer or early fall application of nitrogen fertilizer
 - B. Keep plant rapidly growing right through the acclimation period
 - C. Apply supplemental root zone heating
 - D. Apply heat only to top growth in storage
11. The USDA plant hardiness zone map is a guide to determining plant hardiness.
- A. True
 - B. False
12. The lower numbers on the hardiness zone map are the warmer zones.
- A. True
 - B. False
13. A manager of a nursery should know the root and shoot hardiness of containerized plants. The plants' hardiness is not the same when in a container as it is when in the ground.
- A. True
 - B. False
14. Woody plants that can survive freezing temperatures without injury during winter dormancy is said to be _____.
- A. Cool hardy
 - B. Frost hardy
 - C. Winter hardy
 - D. All of the above
15. Cultural practices can influence hardiness.
- A. True
 - B. False
16. On flowering trees in early spring, damage can occur to flower buds while vegetative buds remain unharmed.
- A. True
 - B. False

17. Freeze damage can be caused by intra or extra cellular ice formation. When intracellular is formed, crystals originate within the cells' _____.
- A. Cytoplasm
 - B. Spongy mesophyll
 - C. Chloroplast
 - D. Protoplasm

Grower Training Manual, Ohio Certified Nursery Technician (OCNT)
Chapter 16 – The Basics of Soils and Growing Media

1. Soil texture is what type of property?
 - A. Chemical
 - B. Biological
 - C. Physical
 - D. Environmental

2. Water holding capacity or drainage characteristics of soil may be improved by adding?
 - A. Soil amendments
 - B. Lime
 - C. Balanced Fertilizer
 - D. Clay

3. Which of the following is not a macro-nutrient?
 - A. Nitrogen
 - B. Chlorine
 - C. Potassium
 - D. Phosphorus

4. How many essential elements are require for plant development?
 - A. 14
 - B. 17
 - C. 21
 - D. 24

5. What elements are provided to the plant by water and carbon dioxide?
 - A. Hydrogen
 - B. Carbon
 - C. Oxygen
 - D. All of the above

6. What is the measure of how much storage capacity the soil had for certain nutrients?
 - A. pH
 - B. Bulk density
 - C. CEC
 - D. IPM

7. Use _____ to lower the pH.
 - A. Lime
 - B. Nitrogen
 - C. Sulfur
 - D. Alkaline

8. Which of the following is not recommended for being used as a soil amendment?
- A. Peat moss
 - B. Wood chips
 - C. Composted leaves
 - D. Mushroom compost
9. The two most critical tests of growing media are pH and soluble salts
- A. True
 - B. False
10. An ideal growing medium should have 75% air capacity by volume
- A. True
 - B. False

Grower Training Manual, Ohio Certified Nursery Technician (OCNT) Chapter 17 – Plant Disease and Pest Management

1. What are the three components of the disease triangle?
 - A. Host
 - B. Environment
 - C. Pathogen
 - D. All of the above
2. Larvae is _____.
 - A. A common root feeding pest.
 - B. An immature stage of pest development.
 - C. Are difficult to diagnose because they are not visibly seen.
 - D. All of the above
3. The leaf of a rose plant has been skeletonized, the pest most likely responsible for this is?
 - A. Cankerworms
 - B. Black vine weevil
 - C. Japanese beetle
 - D. Gypsy moth
4. What are the three types of pest management controls?
 - A. Chemical, biological, cultural
 - B. Cultural, chemical, mechanical
 - C. Biological, cultural, mythical
 - D. None of the above
5. The core idea of IMP is?
 - A. Control of a specific pest
 - B. Control of a specific disease
 - C. Ongoing decision making
 - D. Environmentally friendly pest and disease management
6. What is pesticide resistance?
 - A. When a pest develops a resistance to low light conditions
 - B. When pest develops a resistance to a toxin
 - C. When a pest develops a resistance to predators
 - D. None of the above
7. What is primary or key pest?
 - A. The first pest that gets to the plant
 - B. The only pest on the plant
 - C. The most serious pest that effects a plant
 - D. The pest that kills all other pests on the plant

8. What are some examples of biological controls?
- A. Parasite, pathogen, predator
 - B. Perennial, annual, biennial
 - C. Use of motorized equipment and hand extraction
 - D. Sunlight, water, air
9. Plant treeage is a process of placing diseased or infested plants into one of three groups for treatment consideration.
- A. True
 - B. False
10. Sanitation is considered a _____ tactic in IPM.
- A. Chemical
 - B. Cultural
 - C. Biological
 - D. Petty

**Grower Training Manual, Ohio Certified Nursery Technician (OCNT)
Chapter 18 – Principles of Weed Control in the Nursey**

1. An unwanted plant or a plant growing out of place.
 - A. Daisy
 - B. Dandelion
 - C. Goose grass
 - D. Weed
2. This type of weed completes their life cycle in one year.
 - A. Annual
 - B. Biennial
 - C. Perennial
 - D. Vine
3. Examples of this weed control method include mowing, mulching, cultivation, and hand-pulling
 - A. Biological
 - B. Chemical
 - C. Cultural
 - D. Mechanical
4. These weeds have long, linear leaves with parallel leaf venation.
 - A. Broadleaf
 - B. Grass
 - C. Moss
 - D. Sedge
5. Which type of herbicide do you apply to prevent weed seed from sprouting.
 - A. Nonselective
 - B. Preemergence
 - C. Postemergence
 - D. Selective
6. This is an example of a liquid herbicide formulation
 - A. Dry flowable (DF)
 - B. Emulsifiable concentrate (E or EC)
 - C. Wettable powder (WP)
 - D. Water dispersible granules (WDG)
7. If the recommendation is to use 2lbs ai/A, how many gallons of a 5% granular product would be required to treat $\frac{1}{4}$ acre?
 - A. $\frac{1}{2}$
 - B. 4
 - C. 10
 - D. 40

Grower Training Manual, Ohio Certified Nursery Technician (OCNT)
Chapter 19 – Personnel Relations

1. An effective salesperson should take on these roles; they are _____.
 - A. Manager/boss/owner
 - B. Slob/stock person/driver
 - C. Host/consultant/seller
 - D. None of these

2. One of the most important steps in the sales process is _____.
 - A. Listening
 - B. Talking
 - C. Appearance
 - D. Smiling

3. The most important component in developing good personnel relations is _____.
 - A. Appearance
 - B. Knowledge
 - C. Attitude
 - D. Communications

Grower Training Manual, Ohio Certified Nursery Technician (OCNT)
Chapter 20 – Salesmanship

1. One of the most important steps in the sales process is _____.
 - A. Listening
 - B. Appearance
 - C. Talking
 - D. Smiling

2. Establishing rapport is the process of gaining trust and confidence of the customer.
 - A. True
 - B. False

3. A friendly, smiling, and happy attitude will not help in making a sell to a customer.
 - A. True
 - B. False

4. As garden center employee you should possess product knowledge, friendliness, and sales skills characteristics.
 - A. True
 - B. False

5. An effective salesman should act as a _____.
 - A. Host
 - B. Consultant
 - C. Seller
 - D. All of the above

6. When approaching a customer:
 - A. Make eye contact and greet
 - B. Establish rapport
 - C. Beware of your body language
 - D. All of the above

7. The most important part of developing good personnel relations is _____.
 - A. Knowledge
 - B. Appearance
 - C. Attitude
 - D. Communications