

Chapter 1-Plant Growth and Development

1. T or F. Chloroplasts capture light energy and use it to manufacture the plant's food through the process of respiration.
2. T or F. The lateral cell division that occurs in the vascular cambium is responsible for adding wood to the stem.
3. T or F. Stomates control water loss by periodically opening and closing based on environmental conditions.
4. T or F. Stratification is the process of satisfying seed dormancy.
5. T or F. The force that moves water up through the phloem is a combination of root pressure and transpirational pull.
6. Which of the following parts of a plant or animal cell is only found in plants?
 - a. Nucleus
 - b. Protoplasm
 - c. Mitochondria
 - d. Cell membrane
 - e. Cell wall
7. Which of the following describes the epidermis?
 - a. Exists only in plants exhibiting secondary growth
 - b. Forms a continuous outer layer on the plant surface
 - c. Consists of specialized cells that conduct water
 - d. Contains the meristem that is involved in the production of bark
 - e. Provides structural support
8. Which of the following is true about biennials?
 - a. Biennials flower the first season and die the second year
 - b. Biennials germinate, flower, produce seed, and die within one growing season
 - c. Biennials experience dormancy only as seeds
 - d. Biennials flower the second season and then die
 - e. Biennials are not grown in Michigan because they cannot survive the winter
9. Growth resulting from apical meristems includes
 - a. Increases in plant height
 - b. Primary growth
 - c. Lengthening of roots
 - d. Cell division
 - e. All of the above
10. Which of the following must occur for viable seeds to be produced?
 - a. Cross-pollination
 - b. Fertilization
 - c. Pollination and fertilization
 - d. Wind pollination
 - e. Showy flowers
11. Plants that have male and female flowers on different plants are called
 - a. Epiphytic
 - b. Monoecious
 - c. Dioecious
 - d. Bifoliate

12. Scarification is a process where
 - a. Seeds are kept moist in cold temperatures to enhance germination
 - b. Seeds are subject to drying conditions prior to sowing
 - c. Seed coats are partially removed by mechanical or chemical treatment to enhance germination
 - d. Seeds must go through a wet/dry cycle to enhance germination
13. Photosynthesis, the energy process in green plants, requires:
 - a. Light, water, oxygen
 - b. Water, nutrients, carbon dioxide
 - c. Light, water, nutrients
 - d. Light, water, carbon dioxide
14. Water enters a plant through the roots and is conducted through the plant in the
 - a. Cambium
 - b. Phloem
 - c. Parenchyma
 - d. Xylem
15. Parallel leaf venation, lack of annual rings and floral parts in multiples of threes are distinguishing characteristics of
 - a. Monocots
 - b. Dicots
 - c. Gymnosperms
 - d. Ferns
16. The basic structural unit of plants is the
 - a. Nucleus
 - b. Cell
 - c. Cambium
 - d. Tissue
17. The major difference between plant cells and animal cells is the presence of a
 - a. Cell membrane
 - b. Mitochondria
 - c. Cell wall
 - d. Nucleus
18. Plants that have a _____ root system are more difficult to transplant
 - a. Fibrous
 - b. Geotropic
 - c. Senescence
 - d. Tap
19. The area of the stem that adds to the wood every year is
 - a. Xylem
 - b. Phloem
 - c. Vascular cambium
 - d. Pith

20. The largest group of plants that live longer than two growing seasons are
 - a. Perennials
 - b. Annuals
 - c. Biennials
 - d. Monocots
21. During a period of water stress the stomates will remain
 - a. Open
 - b. Closed
 - c. On the top of the leaf
 - d. Open or closed depending on the temperature
22. When day length controls the timing of reproductive processes in many species, the phenomenon is called
 - a. Photosynthesis
 - b. Photoperiodism
 - c. Pollination
 - d. Geotropism
23. The area where the addition of new cells continues while other plant parts reach maturity is called
 - a. Meristem
 - b. Apex
 - c. Internodes
 - d. Bark
24. The organ whose primary function is to capture light and manufacture food is
 - a. Roots
 - b. Stems
 - c. Leaves
 - d. Flowers
25. Plants that produce poisonous chemicals or toxins do this to
 - a. Ward off predators
 - b. Produce auxins
 - c. Enlarge roots
 - d. All of the above

Chapter 2-Plant Nomenclature and Identification

1. T or F. Plant nomenclature is the scientific system of naming plants.
2. T or F. For each scientific name there is more than one plant to which it can be correctly applied.
3. T or F. Our current plant nomenclature system is a polynomial system developed by the great Swedish naturalist Carolus Linnaeus.
4. T or F. When reading or writing scientific plant names, they must be distinguished from the words that surround them by either underlining, italicising, or setting in bold type.
5. T or F. Plants that result from the interbreeding of separate species are called cultivars.

6. Scientific plant names, in an effort to avoid confusion among the various modern languages, are typically derived from:
 - a. Latin
 - b. Italian
 - c. Greek
 - d. a and c
7. In the binomial plant nomenclature system, the first word is the:
 - a. Genus
 - b. Species
 - c. Cultivar
 - d. Hybrid
8. The term _____ designates plants that are distinct in some noticeable, obvious, or measurable manner as well as traits that are not obvious, such as variations in disease resistance, cold or heat tolerance, or any other chemical or physiological trait.
 - a. Species
 - b. Botanical variety
 - c. Cultivar
 - d. Hybrid
9. A plant family:
 - a. Includes all plants that look alike
 - b. Includes plants that are related in a very broad sense
 - c. Refers to a naturally occurring biological strain of a species
 - d. None of the above
10. Who is responsible for keeping plant nomenclature straight?
 - a. Those in horticulture
 - b. The scientific community
 - c. No one
11. Plants are named using the binomial system which consists of two parts, the first part is the
 - a. Family
 - b. Genus
 - c. Species
 - d. Latin name
12. Hybrids are plants that
 - a. Are naturally occurring biological strain of a species
 - b. Naturally occurring variant that has a geographical distribution
 - c. Plants that are selected or maintained in cultivation and are propagated to retain their distinguishing features
 - d. Result from the interbreeding from separate species or plants within a species
13. Scientific names are always
 - a. Underlined
 - b. Italicized
 - c. Bold Face
 - d. All of the above are correct

14. The first letter of the first part of the name is always
 - a. The
 - b. Capitalized
 - c. Lower case
 - d. Starts with an L
15. Which of the following is another way of writing *Acer rubrum*?
 - a. *Ace red*
 - b. *Acer r.*
 - c. *A. rubrum*
 - d. All of the above
16. Scientific names are derived from
 - a. French
 - b. German
 - c. Latin or Greek
 - d. Just Latin
17. Families include
 - a. Many classes
 - b. More than one family
 - c. More than one genera
 - d. Are followed by the species
18. A subspecies is
 - a. A variant in nature that is not associated with a defined geographical location
 - b. A morphologically distinct plants that vary in some noticeable manner
 - c. A naturally occurring biological strain of a species within a geographical location
 - d. Results from interbreeding of separate species
19. Botanical forms are symbolized by
 - a. Var.
 - b. X
 - c. f
 - d. Cv

Chapter 3-Soil Fundamentals

1. T or F. Topsoil refers to the soil making up the top layer of the soil.
2. T or F. The texture of the soil influences the available pore space in a soil.
3. T or F. Water movement is not dependent on the type of soil.
4. T or F. Organic matter is any carbon-containing material in the soil.
5. T or F. Soil pH is defined as the amount of oxygen ions in the soil solution.
6. Which of the following is not true about having good soil structure:
 - a. Soils are easier to till
 - b. Plant roots are able to penetrate the soil easier
 - c. Good structure reduces the amount of large pore space in the soil
 - d. Good structure improves water movement through the soil

7. Which of the following is not true of nitrogen:
 - a. Can leach out of the soil easily
 - b. Is needed everywhere in the plant
 - c. Deficiency symptoms show up first on the newer leaves
 - d. It is recommended to split up nitrogen applications to get the most benefit
8. When the soil pH is too high (too alkaline):
 - a. The soil must be excavated and new soil brought in
 - b. Sulfur or sulfate compound can be added to lower the pH
 - c. The soil needs to be limed
 - d. Plants can no longer be grown in the soil
9. Bushes turning yellow or trees showing a yellow striping pattern on their leaves can be an indication that:
 - a. The plants are suffering from a micronutrient deficiency due to high soil pH
 - b. The plants are old and need to be replaced
 - c. Stray beams from the atmosphere are zapping the trees and shrubs
 - d. The soil needs to be limed
10. Which of the following is a benefit of soil testing:
 - a. Helps monitor the nutrient status of the soil
 - b. Saves money by pinpointing the nutrients needed by the soil
 - c. Increases yield or quality of the plants by providing optimum conditions for their growth
 - d. Alerts you to possible problems before they show up in the plants, thus providing the opportunity to correct before they become serious
 - e. All of the above
11. Soil texture triangle, identify soils by the percentage of
 - a. Macropores and Micropores
 - b. Nutrient levels
 - c. Sand, silt, clay
 - d. Water infiltration rate
12. What is the smallest soil particle
 - a. Clay
 - b. Sand
 - c. Silt
 - d. Loam
13. A soil that has an equal part of sand, silt and clay is called
 - a. An aggregate
 - b. A mixture
 - c. Loam
 - d. Parent rock
14. The moisture holding capacity of soil is something improved by
 - a. Adding organic matter
 - b. Using tile drains
 - c. Irrigation
 - d. Sand

15. Sandy soils have
 - a. Large soil particles
 - b. Good drainage but little moisture-holding capacity
 - c. Large pore spaces
 - d. All of the above
16. The soil pH is a measure of
 - a. Total soluble salts
 - b. Total nutrients
 - c. Acidity or alkalinity of soil
 - d. Cation-ion exchange capacity

Chapter 4-Water Management

1. T or F. Plant appearance should be used to determine when to water.
2. T or F. Transpiration is the evaporation of water from stomates in the leaves.
3. T or F. Soluble salt levels can cause plant growth problems if levels are too low.
4. T or F. Over-watering is one of the biggest causes of root disorders and disease infections.
5. T or F. Soil type will not likely affect the depth to which water will penetrate.
6. Soluble salt management includes:
 - a. Increased watering to leach out accumulated salts
 - b. Use of slow release fertilizers
 - c. Reduction in non-slow released fertilizers
 - d. All of the above
7. Irrigation efficiency is related to:
 - a. Application uniformity
 - b. Accuracy of irrigation
 - c. Water retention
 - d. All of the above
 - e. A and B only
8. What should you consider when irrigating container plants:
 - a. The rate of water penetration into the soil or container substrate
 - b. The ability of the pot to drain out excess water
 - c. The nutrient status of the soil
 - d. A and B only
9. Why is it important to perform water analysis:
 - a. So that you don't waste water by over applying
 - b. Helps to monitor the nutrient status of the plants
 - c. Alerts you to suitable or unsuitable components for growing plants
 - d. None of the above
10. Water is lost from the soil or container substrates by
 - a. Evaporation
 - b. Transpiration
 - c. Photosynthesis
 - d. Both a and b

11. The major force of water movement through the plant is
 - a. Evaporation
 - b. Transpiration
 - c. Photosynthesis
 - d. Both a and b
12. Woody plants are comprised of
 - a. 30% water
 - b. 40% water
 - c. 75% water
 - d. 90% water
13. Evaporation is the _____ on hotter, windy days with high light intensities
 - a. Highest
 - b. Lowest
 - c. Least affected
 - d. Apparent
14. An EC (electrical conductivity) meter is used to determine
 - a. Total soluble salts
 - b. Acidity or alkalinity of soil
 - c. Cation-ion exchange capacity
 - d. If the soil has been struck by lightning
15. Alkalinity is determined by the
 - a. Level of soluble salts
 - b. Levels of chlorine and nitrogen
 - c. Levels of bicarbonate and carbonates
 - d. Doesn't matter to water quality
16. Which of the following is an ion that could cause problems if too high that is seen in MI?
 - a. Sodium
 - b. Boron
 - c. Manganese
 - d. Zinc
17. Uniformity when irrigated is best achieved by
 - a. Using risers that are shorter than the plants
 - b. Using nozzles that have larger distribution patterns
 - c. Using irrigation systems that apply water in a circular pattern
 - d. Using different irrigation heads with different patterns in a zone
18. Irrigation efficiency is relate to
 - a. Application uniformity
 - b. Accuracy of irrigation
 - c. Water retention
 - d. All of the above
19. Movement of water downward through the soil is called
 - a. Absorption
 - b. Leaching
 - c. Recharge
 - d. None of the above

20. Which of the following is not a component of water quality
- Chemical elements
 - Organic materials
 - Fertilizers
 - Biologicals
 - None of the above

Chapter 5-Plant Nutrition and Nutrient Management

- T or F. 15 nutrients are essential for plants to grow and develop properly.
- T or F. Soil pH is a measure of soil alkalinity.
- T or F. Side-dressing is a method of fertilizer application.
- T or F. Younger plants require more fertilizer.
- T or F. NPK stands for Nitrogen, Phosphorus and Potassium.
- Which of the following is not a method used to indicate fertilizer needs:
 - Soil test
 - Foliar Sampling
 - Plant performance
 - Signs of deficiencies
 - None of the above
- Potassium's function in plants is to:
 - Hasten maturity
 - Improve winter hardiness
 - Give a vigorous start to plant
 - All of the above
- Most plants perform best when the soil pH is:
 - 4.0 to 5.5
 - 5.5 to 6.5
 - 6.0 to 7.0
 - 6.5 to 8
- A complete fertilizer formula such as 20-10-10 indicates:
 - All major elements are present
 - There is 20 pounds of nitrogen
 - Nitrogen is in the amount of 20%
 - A and B only
 - A and C only
- Which of the following is not a method of fertilizer application:
 - Broadcasting
 - Top-dressing
 - Side-dressing
 - Bottom-dressing
- An indication that a plant might have a nitrogen deficiency is
 - Yellowing of the lower leaves
 - Yellowing of the upper leaves
 - Curling of new growth
 - Purplish tint of leaves

12. The percent of potassium oxide in 25-5-15 analysis fertilizer is
 - a. 50%
 - b. 25%
 - c. 15%
 - d. 5%
13. The numbers 10-6-4 in a fertilizer formula stands for the percentages of
 - a. Nitrogen, potassium, magnesium
 - b. Phosphorus, potassium, magnesium
 - c. Nitrogen, phosphorus, calcium
 - d. Nitrogen, phosphorus, potassium
14. Water insoluble nitrogen is a primary component in
 - a. Liquid fertilizers
 - b. Slow release fertilizers
 - c. Granular fertilizers
 - d. Chemical fertilizers
15. Organic nutrients are
 - a. Generally naturally occurring and are derived from living things
 - b. Present in the form of relatively simple compounds
 - c. Generally consistent and of higher analysis
 - d. Generally lower in cost/unit of plant food
16. Plants need _____ essential nutrients
 - a. 20
 - b. 16
 - c. 8
 - d. 4
17. Secondary, or micronutrients, nutrients include
 - a. Iron, Calcium, Oxygen
 - b. Nitrogen, Potassium, Phosphorus
 - c. Calcium, Magnesium, Sulfur
 - d. Nitrogen, Oxygen, Hydrogen
18. A fertilizer is
 - a. Any organic material that is used to add nitrogen to the soil
 - b. Any material of mixture of material used to supply one or more of the essential plant nutrient elements
 - c. Any chemical material containing carbon dioxide
 - d. None of the above
19. Organic fertilizers
 - a. Become available to the plant slowly
 - b. Have to be broken down into an inorganic form before plants can use them
 - c. Improve the structure of the soil
 - d. All of the above
20. An indication that a plant may have a phosphorus deficiency is
 - a. Yellowing of the lower leaves
 - b. Yellowing of the upper leaves
 - c. Curling of new growth
 - d. Purplish tint of leaves

21. Organic fertilizers are best applied
 - a. Late fall
 - b. Early spring
 - c. Middle of summer
 - d. Whenever the plants need it
 - e. Both A and B
22. Soil pH is a measure of
 - a. Soil acidity
 - b. Nutrient content
 - c. Water holding capacity
 - d. All of the above
23. In general, plants like a soil that is
 - a. Neutral
 - b. Slightly acidic
 - c. Slightly alkaline
 - d. More basic
24. To raise the soil pH
 - a. Add limestone
 - b. Add sulfur
 - c. Add organic material
 - d. All of the above
25. Foliar feeding is most successful when
 - a. To replace N-P-K into the soil
 - b. Plants need a slow release fertilizer
 - c. Applying trace elements
 - d. All of the above
26. When growing annual flowers, fertilizers should be applied
 - a. When planted and in the fall
 - b. Every two weeks
 - c. Before planting and again in summer
 - d. Whenever it looks like it needs it
27. Lawns should be fertilized
 - a. Just before it rains
 - b. Depending on the quality of lawn desired
 - c. Depending on the kind of grass present
 - d. All of the above
 - e. Both B and C

Chapter 6-Plant Pests and Diseases

1. T or F. It is not necessary to complete all 14 steps of the plant problems diagnosis process if you are relatively certain you know what the problem is after completing a few of the steps.
2. T or F. Of the thousands of described insect and mite species, a large percentage injure ornamental plants.
3. T or F. All three conditions of the Disease Triangle must be present in order for a biotic disease to infect and develop on its host plant.

4. T or F. Abiotic diseases are infectious, meaning they can be transmitted from one host to infect another.
5. T or F. Integrated Pest Management (IPM) is the practice of using all suitable techniques and methods in as compatible a manner as possible to maintain pest populations at levels below those causing economic injury, and having minimal impact on the environment.
6. The 14 steps in diagnosing plant problems include all but which of the following:
 - a. Collect information
 - b. Compare with healthy plants
 - c. Examine for signs and symptoms
 - d. Examine foliage, stems, and roots
 - e. All the above steps in the diagnosis process
7. Which of the following is not a step in the Integrated Pest Management (IPM) process:
 - a. Identify and understand the host and the pest causing the problem
 - b. Monitor the pest
 - c. Develop the IPM goal
 - d. Identify the appropriate chemical pesticide
 - e. Record and evaluate results
8. Which of the following will not cause a biotic disease infection:
 - a. Fungi
 - b. Soil pH
 - c. Bacteria
 - d. Phytoplasma
9. The Disease Triangle includes all but one of the following conditions:
 - a. Insect
 - b. Pathogen
 - c. Susceptible host plant
 - d. Right environmental condition
10. Some signs of plant disease are:
 - a. Rots, cankers, wilt, dieback, decline
 - b. Chlorosis, necrosis, mosaic/mottling
 - c. Mold, mildew, fungal fruiting bodies, bacterial ooze
 - d. Insect chewing and mining on leaves
11. Abiotic diseases are
 - a. Caused by cultural problems
 - b. Caused by living organisms
 - c. Infectious
 - d. Not controllable
12. The plant disease triangle consists of three parts, the pathogen, the susceptible host plant and
 - a. Control methods
 - b. Conductive environment
 - c. Symptoms
 - d. IPM plan

13. A cause for an abiotic disease would be
- Pollution
 - Overwatering
 - Planting problems
 - All of the above

Chapter 7-Weeds and Weed Control

- T or F. A weed is defined as any plant growing where it is not desired.
- T or F. All weeds die in the winter.
- T or F. Pre-emergence herbicides should be used in the fall.
- T or F. Chemical labeling must include ten items.
- T or F. The most important thing to remember about chemical weed control is to read the label.
- Under the present law, the following must be on a chemical label:
 - Trade name
 - Active or inert ingredients
 - Expiration date
 - All of the above
 - A and B only
- Restricted-use pesticides may be applied by a:
 - Professional applicator
 - Certified applicator
 - Homeowner
 - All of the above
- Which of the following is not a life cycle of weeds:
 - Annual
 - Biennial
 - Perennial
 - None of the above
- On a pesticide label, the directions for use:
 - Are just a suggestion that may be followed or may be ignored if the Applicator knows a better way
 - Give instructions and precautions to be followed
 - Are not required by law to be printed on the label
 - Explain the toxicity of the product
- Which of the following are Hazard statements:
 - Highly Toxic
 - Slightly Toxic
 - Relatively Non-Toxic
 - All of the above
 - A and B only

11. Persons who apply pesticides during the course of their employment must be either a certified applicator or a
 - a. Fumigator
 - b. Architect
 - c. Inspector
 - d. Registered technician
12. Weeds are controlled by using
 - a. Herbicides
 - b. Insecticides
 - c. Miticides
 - d. Disinfectants
13. Hazard statements are found on chemical labels. A moderately toxic pesticide will contain the word
 - a. Danger
 - b. Warning
 - c. Caution
 - d. Non-toxic
14. Weeds are defined as
 - a. Annuals
 - b. Biennials
 - c. Perennials
 - d. Undesired plants
15. Which of the following is true about weeds
 - a. They are both broadleaf and grasses
 - b. The life span is not uniform
 - c. Most difficult to control when they are perennials
 - d. All of the above
16. A restricted pesticide
 - a. Can only be used during a certain season
 - b. Can only be used on certain plants
 - c. Can only be purchased by a certified applicator
 - d. Can be used only with unrestricted regulations
17. The first step in controlling a weed is to
 - a. Buy the herbicide
 - b. Try mechanical methods
 - c. Determine the life cycle
 - d. All of the above
18. Broadleaf weeds are best controlled in the
 - a. Winter
 - b. Spring
 - c. Summer
 - d. Fall

19. Which of the following must be present on the label
 - a. Kind of formulation
 - b. Storage and disposal precautions
 - c. EPA registration number
 - d. All of the above
20. The most important thing to remember about weed control is
 - a. To read the label
 - b. Have a broad knowledge of chemicals
 - c. Use chemicals first
 - d. All of the above

Chapter 8-Landscape Design

1. T or F. "Form follows function" is a common phrase used in all design professions.
2. T or F. Line establishes the structural framework of the landscape by virtue of its dimensions.
3. T or F. Warm colors attract attention and appear to advance in the landscape.
4. T or F. Cool colors are yellow, green, and blue.
5. T or F. Site adaptable characteristics in plant species may limit their widespread use in the landscape.
6. Choose the answer that does not apply to the use of Line in landscape design.
 - a. Carries our eyes through the landscape
 - b. Controls the speed of movement
 - c. Tends to work through highlights and shadows
 - d. Sets edges and boundaries
 - e. Used in developing a floor plan
7. Which form of balance is characteristic of mirror images on each side of the central axis.
 - a. Absolute
 - b. Symmetric
 - c. Proximal
 - d. Asymmetric
 - e. Distal
8. Which factor does not pertain to Site Adaptability in the plant selection process?
 - a. Hardiness
 - b. Geographic range
 - c. Soil pH
 - d. Irrigation
 - e. Light exposure
9. There are two type of scales used in landscape design
 - a. Architect and engineer
 - b. Architect and utility
 - c. Engineer and planner
 - d. Planner and utility

10. Identify the design principle that involves the proportional relationships between elements in the landscape.
 - a. Balance
 - b. Asymmetry
 - c. Emphasis
 - d. Repetition
 - e. Scale
11. Balance, in landscape design refers to the weight on each side of a center axis. When one side of the axis is a mirror image of the other side, it is referred to as:
 - a. Proportionate
 - b. Symmetric
 - c. Asymmetric
 - d. Repetition
12. Warm colors are red and yellow. Plants with warm colors tend to
 - a. Appear short
 - b. Appear tall
 - c. Appear farther
 - d. Appear closer
13. Scale is
 - a. The proportional relationships between elements in the landscape
 - b. Placing larger material in the accent area
 - c. Using different shaped materials in a design
 - d. Repeating materials of the same size
14. The function that usually describes the utilitarian aspect of the landscape such as directing vehicular and pedestrian traffic and influencing soil and wind erosion is
 - a. Aesthetics
 - b. Architectural
 - c. Engineering
 - d. Environmental
15. A straight line in a design will
 - a. Quicken the pace
 - b. Encourage slow and relaxed pace
 - c. Will contrast walls and turf areas
 - d. All of the above
16. Factors that will determine whether a plant will survive at the site pertains to the term
 - a. Management
 - b. Site adaptability
 - c. Form
 - d. Aesthetics
17. Which of the following is not on the Robinette's four major functions that plants serve in the landscape
 - a. Aesthetics
 - b. Engineering
 - c. Form
 - d. Environmental

18. The visual and emotional appeal of a landscape refers to the
 - a. Aesthetics
 - b. Architectural
 - c. Engineering
 - d. Environmental
19. The creation of rooms in a landscape refers to the _____ function
 - a. Aesthetics
 - b. Architectural
 - c. Engineering
 - d. Environmental
20. The function that focuses on creating microclimates and human contact is
 - a. Aesthetics
 - b. Architectural
 - c. Engineering
 - d. Environmental
21. The first step in the design process is
 - a. Meeting the client
 - b. Analyzing the landscape
 - c. Present the master plan
 - d. Complete the graphic presentation
22. A typical scale for residential projects is
 - a. 1/8 inch = 1 foot
 - b. 1 inch = 4 feet
 - c. 1 inch = 10 feet
 - d. 1 inch = 20 feet
23. Which of the following is necessary on a landscape plan
 - a. Title block
 - b. Scale
 - c. North arrow
 - d. All of the above
24. Accent plants, garden art and hardscape features can create
 - a. Proper scale
 - b. Emphasis
 - c. Repetition
 - d. Balance
25. A large building with small plants has improper
 - a. Balance
 - b. Scale
 - c. Emphasis
 - d. Repetition

Chapter 9-Native Plants

1. T or F. Most definitions base native status on a presence in a given ecosystem through natural forces whether they were present before or after European settlement as long as the species is part of the original continental flora.

2. T or F. Identifying a native plant as a Michigan genotype means that its genetic origin is from Michigan.
3. T or F. Biologically speaking, cultivars selected from a native plant species are borne out of the genetics of the species and possesses that same site tolerance, adaptability features and usually similar or enhanced ornamental traits.
4. T or F. The basis for selecting plants, regardless of whether domestic or foreign species, begins with a close examination of their phenotype.
5. T or F. Savannas are intermediate areas between forests and open prairies supporting stress tolerant plant species.
6. T or F. The Great Lakes regions contain 76 natural plant communities covering our upland and wetland systems.
7. _____ refers to the geographic origin of a plant. This refers to the original location where it came from not the nursery where it was grown.
 - a. Genotype
 - b. Phenotype
 - c. Provenance
 - d. Ecoregion
8. Native plant species are part of diverse _____ that have evolved over time to climate, soils, hydrology, competition and other biotic and abiotic influences.
 - a. Ecological communities
 - b. Genotypic regions
 - c. Geographic generations
 - d. Palustrine systems
9. Native plant communities are classified as upland, wetland and estuarine, with subclasses being more specific according to their _____.
 - a. Genotypes and phenotypes
 - b. Components and physical appearance
 - c. Provenance
 - d. Microclimates and soils
10. _____ systems are intermediates between upland and freshwater aquatic systems. They are characteristic of high water tables, saturated soils and standing water.
 - a. Upland
 - b. Wetland
 - c. Estuarine
 - d. Regional
11. _____ systems are areas typically associated with dry soils and plant species that cannot withstand prolonged periods of saturated soils and support dense canopies with corresponding understory vegetation.
 - a. Upland
 - b. Wetland
 - c. Estuarine
 - d. Regional

12. _____ may focus on species adaptability and the respective environmental benefit, thereby being more flexible with the species, their origin and selection through horticultural sources.
 - a. Ecological restoration
 - b. Landscape restoration
 - c. Biological restoration
 - d. Physical restoration
13. The genetic make-up of a plant is
 - a. Genotype
 - b. Phenotype
 - c. Native
 - d. Provenance
14. The results from the interaction between genotype and the environmental is the
 - a. Genotype
 - b. Phenotype
 - c. Native
 - d. Provenance
15. Provenance refers to
 - a. The geographic origin of the plant
 - b. Which nursery the plant was grown in
 - c. The current location the plant is being grown in
 - d. The changing of the plants location
16. Varieties and subspecies are
 - a. Cultivated by humans
 - b. Not reproducible
 - c. The same as the species
 - d. Reproducible by seed
17. Plants that are found in nature, not reproducible by seed and have to be vegetative propagated are
 - a. Variety
 - b. Forma
 - c. Cultivar
 - d. Subspecies
18. Right Plant/right Place focuses on
 - a. Planting native species
 - b. Buying local
 - c. Planning and selection
 - d. Restricting plant selection
19. Most definitions for native plants include the following statements
 - a. Are part of the original continental flora
 - b. Were present before or after European settlement
 - c. Presence in a given ecosystem through natural forces
 - d. All of the above

20. Which of the following statements is always true about native plant species
- They are more adaptable
 - They do not need water
 - They do not need fertilizer
 - They are part of a diverse ecological community that has evolved over time
21. An area that is defined by its structure, physical conditions and the ecological processes within their boundaries are called _____ communities.
- Biological
 - Ecological
 - Geographic
 - Genotypic
22. A native community that has high water tables, saturated soils, and standing water is considered as
- Uplands
 - Forests
 - Wetland
 - Prairie
23. A native community that is typically dry and has plant species that cannot withstand prolonged periods of saturated soils is a
- Upland
 - Forest
 - Wetland
 - Prairie
24. The Michigan Natural Features Inventory contains lists and description of _____ - natural plant communities covering our upland and wetland systems
- 24
 - 50
 - 76
 - 124
25. Which of the following resources have a mission to “actively contribute to decisions that impact the conservation of biological and ecological diversity by collecting, analyzing and communicating information about rare and declining plants...”
- Michigan Natural Feature Inventory
 - USGS North Prairie Wildlife Resource Center
 - Landscape Restoration Handbook
 - All of the above
26. Incorporating native plant species into a cultivated or managed landscape is called
- Landscaping with native plants
 - Landscape restoration
 - Ecological restoration
 - Cultivation landscaping

Chapter 10-The Green Industry and The Invasive Plant Issue: Michigan

- T or F. Federal Executive Order 13112 states as its purpose “to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological and human health impacts that invasive species cause”.

2. T or F. Only those alien (non-native) species that cause substantial, negative impacts to the environment, economies and human health fall under the scope of the National Invasive Species Council.
3. T or F. According to the Executive Order 13112, native plants outside their original ecosystem can potentially be non-native invasive plants.
4. T or F. The Executive Order 13112 has a provision for excusing a plant's invasiveness when its benefits clearly outweigh the potential for harm.
5. T or F. According to the St. Louis Declaration, a small proportion of introduced plant species become invasive and cause unwanted impacts to natural systems and biological diversity as well as to economies, recreation and health.
6. T or F. *Hedera helix*, English Ivy is a highly invasive weed in the forests of the Pacific Northwest and Eastern United States but does not exhibit the same behavior in the Great Plains and Midwest.
7. T or F. The nursery industry through the codes of conduct is encouraged to develop and promote alternative plant material through plant selection and breeding or as stated "to find better behaved cultivars".
8. T or F. With respect to invasive behavior, the genetic differences between cultivars and the original species may result in behavioral traits deemed acceptable for use.
9. An effective management strategy for invasive species integrates:
 - a. Information exchange and public education
 - b. Prevention, early detection and rapid response
 - c. Scientifically informed control and restoration
 - d. All of the above
10. Prevention calls for preventing the introduction and establishment of invasive species by developing _____ to evaluate non-native species currently being considered for importation into the United States.
 - a. Certification certificates
 - b. Screening processes
 - c. Border patrols
 - d. Quarantine sites
11. _____ increases the likelihood that localized invasive populations will be found, contained and eradicated from areas before they come established.
 - a. Early detection and rapid response
 - b. Risk assessments
 - c. Scientific control methods
 - d. Stakeholder collaboration
12. It is commonly agreed that the potential for a particular plant to behave "invasively" depends on the _____ in which it exists. This situation occurs with many plant species and means that any effort to address the invasive species problem must include this consideration.
 - a. County
 - b. State
 - c. Country
 - d. Region

13. Recommendations evolving from the Chicago Symposium stated that: efforts to place invasive plant species on official lists must include research, where needed, to ensure that “listed” plants do, in fact, have invasive characteristics; and well understood _____ for listing a plant as “invasive” must be developed prior to completing invasive plant species lists.
 - a. Criteria
 - b. Response
 - c. Detection
 - d. Process
14. A proactive approach to the invasive plant issue is to promote environmentally responsible use through:
 - a. Early detection and rapid response
 - b. Plant selection, placement and management
 - c. Prevention and risk assessment
 - d. Stakeholder input
15. Environmentally responsible plant selection adds biological character into the equation. Biological character is broadly defined by:
 - a. Vegetative habit, reproductive characteristics and dispersal ability
 - b. Plant selection, placement and management
 - c. Prevention, early detection and rapid response
 - d. Ecosystem, plant community and region

Chapter 11-Sustainability and The Green Industry

1. T or F. Sustainability refers to alternative living approaches that maintain the quality of human life and the health and integrity of our natural environment.
2. T or F. United Nations World Commission on Environment and Development defined sustainability as “meeting the needs of the present generation without sacrificing the needs of future generations”.
3. T or F. Industrial ecology strives for the minimal use of renewable resources and maximum use of non-renewable resources.
4. T or F. BuildingGreen, Inc. proposed that being sustainable uses all resources (energy, water, material and land) efficiently; protects the natural environment; and creates a healthy built environment.
5. T or F. Being “green” and the heart of sustainability for the Green Industry is to efficiently manage our resources, protect the natural environment, create and maintain a healthy built environment; and ensure economic stability and prosperity.
6. Sustainability principles are rooted in _____ disciplines and strive for resource efficiency and economically sound and environmentally friendly approaches.
 - a. People, plants and animal
 - b. Economic, scientific and sociological
 - c. Organic, inorganic and microbial
 - d. Design/build

7. Assessing sustainability is a comprehensive exercise and involves:
 - a. Examining our use of resources
 - b. Identifying intersecting cycles of energy flow and materials
 - c. Evaluating the economic impact of sustainability practices upon goods and services by completing a cost/benefit analysis
 - d. All of the above
8. The “triple bottom line” is an accounting standard that measures organizational and societal success not only in terms of financial gain or stability; but also in terms of environmental and social performance. Triple Bottom Line promotes:
 - a. People, Planet and Profits
 - b. People, Plants and Animals
 - c. Food, Water and Atmosphere
 - d. People and Resources
9. One of the goals of industrial ecology is to modify the linear flow of materials and energy typically present in industrial systems to a _____ flow. In this flow, wastes are reused as energy or raw materials for another product or process. This approach mimics the flow present in the natural world.
 - a. Closed
 - b. Linear
 - c. Cyclical
 - d. Open
10. There are numerous programs focused on sustainability within various segments of the Green Industry. Examples of environmentally sustainable management systems are:
 - a. EcoHort
 - b. Be Water Wise
 - c. Sustainable Sites
 - d. All of the above
11. In determining a starting point for which to understand what sustainability is, it would be helpful to review popular definitions utilized by all parties EXCEPT for whom:
 - a. The government
 - b. All local citizens
 - c. Industry
 - d. Nonprofit agencies
12. The Nature Conservancy in conjunction with Chicago Wilderness proposes that sustainable land development consists of three components which include:
 - a. Environmental impact, recyclable materials and an abundance of green space
 - b. Environmental integrity, economic prosperity and community livability
 - c. Economically valued, run by volunteers and built with recyclable material
 - d. Reduces footprint, cheapest in cost and architecturally sound
13. The “triple bottom line” is an accounting standard that argues that environmentally sustainable practices are ultimately more _____ for a business.
 - a. Expensive
 - b. Profitable
 - c. Rewarding
 - d. Reliable

14. In 1987, the United Nations World Commission on Environmental and Development (UNWCED) formulated what is perhaps the most widely accepted definition of sustainability. They defined sustainability as:
 - a. “preserving everything and living to serve our future generation.”
 - b. “what man will destroy, man will invent again.”
 - c. “meeting the needs of the present generation, without sacrificing the needs of future generation.”
 - d. “reduce, reuse, recycle.”
15. The Building Green, Inc goal is to allow future generations to have a high quality of life by
 - a. Using all resources efficiently
 - b. Protecting the natural environment
 - c. Creating a healthy built environment
 - d. All of the above
16. The U.S. Environmental Protection Agency uses “the use of materials, processes, or practices that reduce or eliminate the creation of pollutants at the sources” to define
 - a. Waste minimizations
 - b. Sustainability
 - c. Pollution prevention
 - d. Raw material consumption
17. Excess soil and brush from clearing operations, grass clippings and pruned plant material is considered _____ to the Green Industry.
 - a. Waste material
 - b. Pollution
 - c. Raw material
 - d. All of the above

Chapter 12-Successful Sales Strategies and Customer Relations

1. T or F. Making money should be your primary sales goal.
2. T or F. Good marketing is simply meeting the needs of the customer.
3. T or F. Your attitude should be sales oriented, not customer oriented.
4. T or F. One effective greeting is to talk about the weather.
5. T or F. When a customer visits your establishment and after the greeting and transition, you might consider asking for a direct need or concern.
6. T or F. You won't be able to engage all customers and may not have time to, either.
7. T or F. One direct way to close the sale is to ask how the customer would like to pay for the product, thus you are implying that they will purchase the item.
8. Marketers who understand their role in the sales process
 - a. Have the highest sales of their competitors
 - b. Have a reputation that attracts customers with marketers spending little of their resources
 - c. Have a greater customer satisfaction and greater profitability for their company
 - d. Spend 3% of sales on advertising

9. Customers will likely come to garden centers, nurseries and landscape service providers with:
 - a. Wants
 - b. Problems
 - c. A concern that is difficult to articulate
 - d. All of the above
10. What results from a sales transaction that meets customer's needs:
 - a. Profit alone
 - b. Profit and repeat business
 - c. Profit and knowing that you have met all the customer's current and future needs
11. All products have:
 - a. Benefits and features
 - b. A lifetime warranty
 - c. A promise that consumers will be loyal customers
12. Who decides what products and services are a real value?
 - a. Customers
 - b. Sales staff
 - c. Management
 - d. All of the above
13. One of the best ways to overcome the price objections is to
 - a. Show them something less expensive
 - b. Tell them it really is worth the price
 - c. Show them what they get in value (time savings, labor savings) for what they pay
 - d. Show them something more expensive
14. How many questions should you ask a customer before you make a product or service recommendations?
 - a. None
 - b. 10
 - c. 20
 - d. As many as it takes to make an accurate assessment of the situation
15. Your sale goal should be
 - a. Making money
 - b. Helping the customer identify their needs and then meet their needs through products and services
 - c. Pushing products on customers
 - d. Providing the customers' needs at a minimal cost
16. Good marketing is
 - a. Pushing products on the customers
 - b. Selling a product or service that the customer does not need
 - c. Meeting the needs of the customer by providing products they value
 - d. Creating a problem for the customer to handle
17. Your attitude should be
 - a. Customer oriented
 - b. Sales oriented
 - c. Money oriented
 - d. Positive

18. Which of the following is considered a basic communication skill?
 - a. Smile, be polite and ask permission
 - b. Speak in a clear manner and look the person in the eye
 - c. Be a professional
 - d. All of the above
19. Just as important as basic communication skills is being
 - a. Technically competent
 - b. Able to fake answers
 - c. Not worry about your appearance
 - d. Able to gossip or express your bad days
20. The first step in the sales process is
 - a. Greeting the customer
 - b. Inquiry about specific needs or challenges
 - c. Offering alternatives
 - d. Answering objections and questions
21. When answering a phone call the first thing you should do is
 - a. Ask how you can help them
 - b. Thank them for calling
 - c. Answer with the name of the company and your name
 - d. Invite them to visit
22. A question to ask a customer that does not invite the “just looking” response would be
 - a. Would you like to see the fabulous Impatiens that we just got in?
 - b. Would you like to know the weekly specials?
 - c. Can I help you find something?
 - d. Do you have a sunny or partial shady location where these new Impatiens would look great?
23. When assisting a customer come up with
 - a. 2-3 possible solutions with three price points
 - b. The most expensive solution first to sell to the customer
 - c. A product to sell
 - d. Ignore their needs and concentrate on the specials
24. All products have
 - a. A guarantee
 - b. Lifetime warranty
 - c. Benefits and features
 - d. A promise that consumers will be loyal customers
25. The most common objective is that the product or service
 - a. Does not come with installation
 - b. Costs too much
 - c. Takes too much of the customers time
 - d. Has too many benefits or features
26. One of the best ways to overcome the price objections is to
 - a. Show them something less expensive
 - b. Tell them it really is worth the price
 - c. Show them what they get in value for what they pay
 - d. Show them something more expensive

27. Which of the following is a way to close the sale
- Asking how they would like to pay
 - Asking if they would like an item wrapped or boxed up
 - Asking if they would like to schedule a delivery
 - All of the above

Chapter 13-Industry Laws and Regulations

- T or F. The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the waters of the United States.
- T or F. On-line reporting of water use to the Michigan Department of Agriculture & Rural Development is available.
- T or F. The Michigan Occupational Safety and Health Administration (MIOSHA) standards only apply to large corporation and not to small employers in the Green Industry.
- T or F. The two basic categories of nursery licenses issued in Michigan are Dealers Licenses and Grower Licenses.
- T or F. A business who grows herbaceous perennials would be issued a Dealer's License in Michigan.
- T or F. Any person who holds themselves out to the public as being in the business of applying pesticides for hire must obtain a commercial pesticide applicator business license for each place of business.
- T or F. A pesticide label is not a legal document.
- T or F. In the state of Michigan, you are operating a commercial motor vehicle in interstate commerce if your vehicle has an actual gross vehicle weight (GVW) or gross combination vehicle weight (GCW) of 10,001 pounds or more.
- Under the Clean Water Act (CWA), EPA has implemented control programs such as:
 - Setting wastewater standards for industry
 - Requiring rain water collection for new development
 - Regulating water use for specific industries (including agriculture)
 - All of the above
- Industries with a combined capacity that exceeds _____ gallons of water per day from all sources (excluding residential use) under common ownership or farm as defined by the Michigan Right to Farm Act, must report to the Michigan Department of Agriculture and Rural Development (MDARD).
 - 10,000
 - 100,000
 - 500,000
 - 1,000,000
- The Michigan Occupational Safety and Health Administration (MIOSHA) standards relevant to the Green Industry detail the types of training necessary for the safe operation of mobile equipment. Best practices for this area include all of the following except:
 - Training employees on the equipment and the hazards
 - Testing and evaluating their knowledge of the material
 - Providing operator permits for all mobile equipment being used
 - Assuring documentation of training and testing is available at the site

12. Minimum personal protective equipment requirements are established in the absence of minimum equipment requirements on the pesticide label and include all of the following except:
 - a. Long sleeve shirt
 - b. Long pants
 - c. Face mask
 - d. Gloves
13. A commercial pesticide application business license expires annually on December 31 and must be renewed prior to:
 - a. Any activity considered to be holding oneself out to the public as being in the business of pesticide application
 - b. Actually performing any pesticide applications
 - c. Establishing any contracts with clients for pesticide application
14. Which of the following information is not found on a pesticide label:
 - a. Name of the product
 - b. Ingredient statement
 - c. Manufacturer name and address
 - d. Storage and disposal
 - e. All of the above is found on a pesticide label
15. In Michigan, if you operate a commercial motor vehicle that requires a CDL, which of the following requirements must be met to be in compliance with state regulations?
 - a. The operator of the vehicle must have a Commercial Driver's License (CDL)
 - b. Business identification and USDOT number must be displayed on both sides of the power unit
 - c. Proof of vehicle's annual inspection must be with the vehicle
 - d. All of the above
 - e. a and b only

Chapter 14-American Standard for Nursery Stock

1. T or F. The purpose of the American Standard for Nursery Stock is to provide buyers and sellers of nursery stock with a common terminology in order to facilitate transactions involving nursery stock.
2. T or F. The American Standard for Nursery Stock is designed to be applicable to transactions within the nursery trade as well as retail consumer transactions.
3. T or F. The American Standard for Nursery Stock is divided into 13 different plant groups.
4. T or F. The American Standard for Nursery Stock is a communication tool as well as a way of providing buyers with some assurance of the health and quality of the nursery stock being specified or sold.
5. T or F. In the landscape or nursery trade, the caliper is the diameter of a tree, measured at a point 4 ½ feet above the ground line.

6. In order to locate the specifications for a particular plant in the American Standard for Nursery Stock, you should know all of the following except:
 - a. Size of plant
 - b. Type of plant
 - c. Growth habit
 - d. Method of production
 - e. All of the Above
7. The line of junction between the root of a plant and its stem or trunk is the:
 - a. Crown
 - b. Collar
 - c. Trunk
 - d. Branch
8. A plant dug bare root, while dormant, to which a moist growing medium is added around the roots to form a ball designed to sustain plant growth is called:
 - a. Balled and potted
 - b. Balled and burlapped
 - c. Processed balled plant
 - d. Bare root
9. The portion of a tree comprising the branches is the:
 - a. Collar
 - b. Crown
 - c. Spread
 - d. Fan
10. _____ is a classification unit based on a specific size or size range, number of stems or canes, etc.
 - a. Medium
 - b. Height
 - c. Growth habit
 - d. Grade