

**NATIONAL FFA NURSERY/LANDSCAPE
CAREER DEVELOPMENT EVENT
GENERAL KNOWLEDGE EXAM
2021**

Directions: Select the best answer for each item and mark your selection on the answer sheet provided. Using a #2 pencil, completely darken in the letter on the answer sheet that corresponds to your answer for each item.

1. Most containerized shrubs suitable for planting the landscape are measured by:
 - A. total plant height.
 - B. diameter of the shrub at the widest portion.
 - C. stem caliper.
 - * D. pot size in gallons.
2. Non-verbal skills are important in salesmanship and client relations. One non-verbal signal that helps indicate that you are listening intently to the client is:
 - A. Crossing your arms.
 - * B. Leaning slightly forward as the client speaks.
 - C. Asking the client to repeat themselves.
 - D. Maintaining an emotionless facial expression as the client speaks.
3. Mulching of landscape plants has several benefits. Which of these is **NOT** a benefit of mulching?
 - A. Controlling of weeds
 - B. Reducing water loss from the soil
 - * C. Controlling of scale insects
 - D. Moderating of soil temperatures
4. Landscape and nursery plants are sold by the ____ name to help assure that the plants being purchased are the expected type, mature size, color, etc.
 - * A. Genus, species, and sometimes cultivar
 - B. Family and Order along with genus
 - C. Common name used in that area
 - D. The most widely used common name
5. Some plants used in the landscape have adapted well to the area where they were planted and have escaped and now grow as nuisance or weed plants, competing with native plants in the area. These plants are called ____ plants.
 - A. Hostile
 - * B. Invasive
 - C. Specimen
 - D. Agnostic
6. Landscape plants are rated by hardiness zones which identify geographical areas by climate and are used to determine where a plant species will grow best. Which of these publishes the most widely used plant hardiness zone map?
 - A. National Nursery and Landscape Association
 - B. National Association of Landscape Professionals
 - C. United States Department of Weights and Measures
 - * D. United States Department of Agriculture

7. While plants vary in their ideal pH range, plant nutrients are generally most available with a soil pH in the ____ range.
- * A. 6.5
 - B. 5.0
 - C. 4.0
 - D. 7.5
8. Which of these is a naturally occurring plant hormone which promotes and regulates plant growth.
- * A. Auxin
 - B. Tannins
 - C. Resin
 - D. Alkaloids
9. The agriculture teacher was explaining to the class why a holly plant in the school landscape produces beautiful red fruit while the holly plant beside it never produces fruit. He told the class that the one without fruit has staminate flowers, which means that the plant:
- A. had no anthers.
 - * B. was a male.
 - C. was a gymnosperm.
 - D. was an angiosperm.
10. A landscape planner is preparing a list of hardscape items to be installed. Which of these items should **NOT** be included on the hardscape list?
- A. Patio
 - B. Fountain
 - C. Flagstone walk
 - * D. Hedge
11. A homeowner brought a turf sample to the nursery stating that his lawn looked like the grass tips were dead. Upon examination, it was determined that the grass tips were indeed dry, brown, frayed, and unattractive. The most likely cause is:
- A. pushing the lawn mower too slow.
 - * B. a dull lawn mower blade.
 - C. the blade is not turning fast enough.
 - D. the grass was mowed in the late afternoon.
12. What is a common cause of scalping in turf?
- A. pushing the mower too slowly
 - * B. setting the cutting height too low
 - C. uneven coverage of irrigation water
 - D. inconsistency of fertilizer application
13. Which of these is seldom used in commercial nursery potting media?
- * A. Topsoil
 - B. Perlite
 - C. Peatmoss
 - D. Bark
14. A new employee accidentally applied double the recommended rate of fertilizer to the potted shrubs in the nursery. Fearing it was enough to severely damage or kill the plants, the best course of action might be to:
- A. apply an herbicide.
 - B. apply lime.
 - * C. leach the soil.
 - D. cover the crop with heavy shade until they recover.

15. A crop of annual bedding plants had been produced during the winter in the greenhouse and were growing rapidly in the warm environment and the increasing day length of spring. The grower began reducing watering, and fertilization, and to lower the greenhouse temperature to prepare the plants to be planted in the landscape. In horticultural terms she was:
- * A. hardening off the plants.
 - B. frost-proofing the plants.
 - C. inducing bloom buds.
 - D. roughing the edges of the plants.
16. A heavy nitrogen application to a crop is likely to cause:
- A. faster blooming.
 - B. yellowing of the leaves.
 - C. defoliation of the top-most leaves.
 - * D. excessive vegetative growth.
17. What is the most likely causes of tall, spindly growth of container-grown nursery plants?
- * A. overcrowding in the growing area or heavy shade
 - B. overfertilizing and under watering
 - C. low nutrition and under watering
 - D. low calcium and magnesium in the soil
18. Which of these is **NOT** commonly used in fertilization of landscape plants or container nursery plants?
- A. constant liquid feed
 - B. slow release fertilizer
 - C. granular fertilizer
 - * D. nutrient sublimation
19. All the following are plant diseases caused by a virus, fungus, or bacteria **EXCEPT** ____.
- A. mildew
 - B. fusarium
 - * C. chlorosis
 - D. rust
20. Before attempting maintenance or repairs on a push mower, always turn the mower off and:
- A. switch off the air filter.
 - B. place the mower on blocks high enough that the wheels do not reach the floor or ground.
 - * C. disconnect the spark plug wire.
 - D. remove the fuel tank.
21. A rule-of-thumb for mowing turfgrasses is to mow often enough that no more than ____ of the leaf blade is removed during each mowing.
- A. one-half
 - * B. one-third
 - C. one-fourth
 - D. One-fifth
22. Pesticide products with the signal word ____ are the most toxic.
- A. CAVEAT
 - * B. DANGER
 - C. WARNING
 - D. CAUTION

23. The most limiting factor in maintaining interior plantscapes is usually:
- A. controlling pests without contaminating the indoor environment.
 - B. increased fertilization needs.
 - * C. providing the amount of light required for proper plant health.
 - D. the need for visits by a technician for plant grooming, fertilization, and irrigation.
24. The outermost circumference of a tree canopy where water drips from and onto the ground is called the:
- * A. drip line
 - B. arch line
 - C. limb line
 - D. rain line
25. This type of insurance provides wage replacement and medical benefits to employees injured in the course of employment.
- A. Umbrella insurance
 - B. Liability insurance
 - * C. Workers compensation insurance
 - D. Property insurance
26. What is the primary purpose of the publication "American Standard for Nursery Stock?"
- * A. To provide buyers and sellers common terminology and standards in plant sizes
 - B. To provide proper nomenclature for nursery stock to facilitate sales
 - C. To facilitate the transportation of nursery stock across state lines.
 - D. To establish standards for hardscape materials.
27. Which of these is **NOT** terminology used in the safety precautions for pesticides?
- A. REI - Restricted Entry Interval
 - B. LD50 – Lethal Dose
 - C. PPE – Personal Protective Equipment
 - * D. STA – Safety Time Assessment
28. A customer has been told that the plants they purchased require full-sun. The customer asked, "What does "full sun" mean?" Which of the following is the best answer? Full sun generally means ___ hours or more per day of unobstructed sunlight.
- A. 12
 - B. 10
 - * C. 6
 - D. 4
29. It is desirable for landscape plants to have deep roots and are therefore better able to withstand temporary periods of drought. Which of these practices will encourage plants to become more deeply rooted?
- * A. Deep watering on a less frequent basis, perhaps every 3–5 days depending on conditions.
 - B. Light watering each day until the plant becomes established.
 - C. Heavy watering each day until the plant becomes established.
 - D. Watering each morning and afternoon until the plant is established.
30. It is important to have one sprayer that is only used for ____ and one or more other sprayers for different types of pesticides.
- A. fungicides
 - B. miticides
 - C. insecticides
 - * D. herbicides

31. Newly planted trees are often supported with stakes, wires, rope, nylon cords etc. Leaving cords or wires around the tree trunk too long may lead to a condition known as ____ where the tree grows around the supporting materials.
- * A. girdling
 - B. choking
 - C. weeping
 - D. strangling
32. The best example listed of an indirect cost for a landscape installation business is:
- A. shrubs
 - B. trees
 - C. mulch
 - * D. truck
33. The front yard area of a residence is sometimes referred to as the ____ area.
- A. private
 - B. service
 - * C. public
 - D. living
34. Which type of mower is best to use on highly manicured turfgrass areas such as golf greens and in other high maintenance turf sites?
- A. flail
 - B. rotary
 - * C. reel
 - D. zero-turn
35. Which of these is the primary purpose of installing landscape fabric?
- A. To moderate soil temperature.
 - * B. To prevent weed growth.
 - C. To encourage soil air exchange.
 - D. To hold newly planted groundcovers in place.
36. Generally, which of the following is true about the foliage texture of landscape plants?
- A. Large leaved plants provide a fine visual texture.
 - * B. Coarse textured plants should be used sparingly in small areas.
 - C. Only fine textured plants should be used in plantings for screening large areas.
 - D. Only coarse textured plants should be used in foundation plantings.
37. Which of these statements is **NOT** true?
- * A. A wilting plant is always an indication of a lack of water.
 - B. Weeds use soil moisture that might otherwise be used by the crop.
 - C. Mulch around plants in the landscape helps conserve water in the soil.
 - D. Potted plants are generally irrigated until water runs out the bottom of the pot.
38. Gasoline blowers have been banned in many communities because:
- * A. The decibel rating is high, causing noise pollution and possible hearing loss.
 - B. Gasoline blowers have been rated as a fire hazard due to the highly flammable nature of gasoline.
 - C. The weight associated with the machine and pressure exerted onto the soil.
 - D. Some states have banned the use of fossil fuels in horticulture.

39. This plant disorder covers the leaves with a whitish material. It rests on the leaf surface and absorbs sap from plant cells. Infected leaves are often twisted and gnarled.
- A. Mealy mold
 - B. White blush
 - C. Silver mildew
 - * D. Powdery mildew
40. A customer wants flowering bedding plants for the home landscape that can be planted in the fall in Indianapolis and can best withstand freezing weather and provide color late into the fall. Which of these choices would be the best plants to suggest to this customer?
- A. wax begonias and clematis
 - B. impatiens and periwinkle
 - C. coleus and marigolds
 - * D. pansies and snapdragons
41. Which of these is generally recognized as the most expensive method of lawn establishment?
- A. seeding
 - B. sprigging
 - * C. sodding
 - D. hydroseeding
42. A client wants a turfgrass that is extremely heat tolerant. Which of these would be the best choice?
- A. Bentgrass
 - B. Kentucky Bluegrass
 - * C. Bermudagrass
 - D. Fountain grass
43. One reason nutsedge is especially difficult to control by mechanical means such as tilling and hand-pulling is because it:
- A. reproduces by spores that spread easily in the wind.
 - B. is toxic to animals.
 - C. can grow easily from leaf-piece cuttings.
 - * D. produces underground tubers that are difficult to kill.
44. This pest control method utilizes a combination of pest management techniques designed to minimize the use of hazardous pesticides.
- A. APHIS
 - B. PPE
 - C. LD₅₀
 - * D. IPM
45. This agency is responsible for ensuring safe and healthy working conditions. It enforces workplace standards, provides training, and inspects businesses to ensure that employers provide a workplace that is free from recognized hazards that are likely to cause harm to the employees.
- A. American Community and Workplace Administration
 - * B. Occupational Safety and Health Administration
 - C. Cooperative Extension Service
 - D. Hazard and Health Prevention Administration

46. Which of these would **NOT** be appropriate when replying by email to a client of the company?
- * A. typing in all upper case to emphasize important points
 - B. addressing the recipient by Mr., Ms., Dr., etc.
 - C. concluding the message by inviting them to write back if they have further questions
 - D. writing the email in language similar to that used in business letters
47. When installing a landscape or nursery crop irrigation system from a potable water source, this device should be installed to prevent water from flowing back into the system and contaminating the drinkable water supply.
- A. On/Off valve
 - * B. Backflow prevention valve
 - C. Reduced pressure valve
 - D. Dual-flow prevention valve
48. An accurate inventory of tools and equipment that includes the number of each item, condition, cost, and depreciation should be kept to assure an accurate record of company assets and:
- * A. maintenance schedule.
 - B. consumable list.
 - C. client satisfaction.
 - D. routing schedule.
49. Which of these instruments is a tool **NOT** normally useful in landscape and nursery businesses?
- A. Global Positioning System (GPS)
 - B. Global Information System (GIS)
 - * C. Sling psychrometer
 - D. Laser level
50. Turfgrasses are cut to specific heights based on the type of grass, season, use, etc. No matter the turfgrass species, most are cut higher than normal during ____ to prevent water loss.
- A. Spring
 - * B. Summer
 - C. Fall
 - D. Winter

End
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Directions: Select the best answer for each item and mark your selection on the answer sheet provided. Using a #2 pencil, completely darken in the letter on the answer sheet that corresponds to your answer for each item.

1. A designer paired a red/purple barberry with a yellow sunshine ligustrum near the front door. These evergreen shrubs grow to similar size. Which of these was the designer probably trying to achieve?
A. Rhythm
* B. Focalization
C. Simplicity
D. Symmetrical balance
2. Which of these statements is true about early spring flowering shrubs?
A. They should be pruned in mid-winter.
* B. Their flower buds develop on wood from the previous growing season.
C. Early spring pruning means more flowers, which develop quickly.
D. They develop flowers on new spring growth.
3. Which of these is an herbaceous perennial?
A. Mahonia
B. Spiraea
* C. Hosta
D. Azalea
4. Non-verbal communication skills are important in salesmanship and client relations. One non-verbal signal that helps indicate that you are listening intently to the client is:
* A. Eye contact
B. Looking outside the sales space
C. Hands on hips
D. Wrinkling the nose
5. Mulching landscape plants has several benefits. Which of these is **NOT** a significant benefit of mulching?
A. Winter protection
B. Reducing water loss from the soil
* C. Nutrient modification
D. Moderation of soil temperatures
6. In the landscape plant botanical name, *Acer saccharum cv.*, the 'cv.' stands for:
A. Color variation
B. Cultivar vitae
C. Common variety
* D. Cultivar
7. A landscape plant is tagged "Zones 5-9". What does this mean?
* A. That the plant will survive the winters in USDA Climatic Zones 5-9.
B. That the plant will survive with natural rainfall in Zones 5-9.

- C. That the plant will survive in the National Association of Landscaper's Zones 5-9.
D. That the plant will survive all naturally occurring conditions in Zones 5-9.
8. Lawn grasses vary in their ideal soil pH range, but a general range for best nutrient availability is:
* A. 6.5 to 7.0
B. 5.0 to 6.0
C. 4.5 to 5.5
D. 5.5 to 5.7
9. Auxin is important in plant production. It is best described as:
A. A naturally occurring resin for stem elongation.
* B. A plant hormone used to stimulate the rooting of cuttings.
C. A synthetic herbicide.
D. A city in Texas with a huge international nursery trade.
10. When using a walk-behind mower on a steep sloping lawn, it is safest to mow:
* A. across the slope
B. in a crosshatch pattern
C. up and down the slope
D. up the slope only
11. While on vacation your lawn grew to 6 inches tall. What is the best thing to do in this case?
A. Mow the lawn in a crosshatch pattern and then in a circular pattern.
B. Cut the grass as close as possible, less than 1" high, to give it a fresh start.
C. Irrigate the lawn to soften the leaf blades, then mow to the normal height.
* D. Cut it now taking off about 1/3 of the length and then again in 3-5 days.
12. Which of these is a pesticide signal word and is used on pesticides that are less toxic than others?
A. CAVEAT
B. DANGER
C. WARNING
* D. CAUTION
13. One of the advantages of a zero-turn mower over conventional riding mowers is:
A. cost
B. height of cut
* C. maneuverability
D. all of these
14. The backyard area of a residence is sometimes referred to as the ____ area.
* A. private
B. service
C. public
D. living
15. A designer placed *Mahonia aquifolia* and *Buxus microphylla* near each other in the foundation planting. This designer was most likely trying to capitalize on:
A. The blooms of the Buxus against the color of the Mahonia.
B. The complimentary and profuse spring bloom colors of each.

- * C. The contrast in texture of the two plants.
 - D. The complimentary colors of the plants.
16. A beginning nurseryman has the following plants in gallon pots under a 70% shade cloth this summer. Which of the plants would you expect to not do as well as the others under 70% shade?
- A. Pachysandra
 - B. Astilbe
 - * C. Mugo pine
 - D. Hosta
17. The vascular tissue of plants that conducts sugars and metabolic products downward from the leaves is called the:
- A. Xylem
 - * B. Phloem
 - C. Cotyledon
 - D. Lenticles
18. The first root of a germinating seed forms from this part of the seed.
- A. Endosperm
 - B. Cotyledons
 - * C. Radical
 - D. Hypocotyl
19. One of the major problems of many landscape plants is a pest in the class Arachnida. This pest attacks plants by feeding on the sap of plant leaves.
- A. Aphids
 - B. Japanese beetles
 - * C. Spider mites
 - D. Mealy bugs
20. Which of these is the best definition of a systemic pesticide?
- A. A fungicide that moves through the soil to control microorganisms.
 - B. A larvicide that kills immature insects feeding on the plant or living in the soil.
 - C. An insecticide that moves through the plant making it toxic to insects.
 - * D. A pesticide that is absorbed and transported through the plant.
21. Which of these most accurately describes symptoms of iron deficiency in plants?
- A. A waxy substance expelled from the axils of the leaves
 - * B. Yellowing of the leaves in between the dark green veins
 - C. A white, powdery buildup on the surface of the leaves
 - D. Holes in the leaves with crisp, brown edges
22. Which of these is generally the fastest method of establishing a lawn, but also is usually the most expensive?
- A. seeding
 - B. sprigging
 - * C. sodding
 - D. hydroseeding

23. It is generally recognized that plants need ____ essential nutrients to perform best.
- A. 3
 - B. 7
 - C. 9
 - * D. 16
24. Why are native plants often a better choice for landscape plants?
- * A. They are adapted to the local environmental conditions and may require less water.
 - B. They are easily obtained from nature and are deer resistant.
 - C. They are more aesthetically pleasing than non-natives.
 - D. Native plants will out-compete invasive plants.
25. This fertilizer nutrient is readily lost from the soil through leaching, soil erosion, and runoff. Levels of this nutrient can fluctuate widely with weather and soil conditions over short time periods. It is applied to crops according to general recommendations rather than soil test results.
- * A. Nitrogen
 - B. Phosphorus
 - C. Potash
 - D. Magnesium
26. The financial analysis of Bob's Landscaping business last year revealed the following data. Which of these tells Bob most about the profitability of his business?
- A. Inventory = \$13,750
 - B. Gross sales = \$268,000
 - * C. Net = \$81,000
 - D. Payroll = \$65,000
27. Small retail nurseries often have difficulty competing with big box chain stores. Which of these strategies might best help small stores compete?
- A. Setting prices lower than the box stores.
 - * B. Providing better customer service.
 - C. Advertising on local radio stations.
 - D. Criticizing box and chain stores to their customers.
28. Which of these trees provides the best fall color?
- A. Eastern White Pine
 - * B. Ginkgo
 - C. Cherry Laurel
 - D. Norway Spruce
29. Night lighting of the landscape can have dramatic effects, adding beauty and enjoyment to the home landscape. A variety of effects is possible, depending on the lighting type and placement. Which of these is a type of commercially available lighting used in landscape lighting for the home?
- A. Differential lighting
 - B. Sequel lighting
 - * C. Down lighting
 - D. Lime lighting
30. Generally, in residential landscape design, _____ is the focal point of the public area of the landscape.

- * A. The front door
 - B. The front walkway
 - C. The driveway
 - D. The driveway and the walkway in combination
31. Safety Data Sheets (SDS), formerly known as MSDSs or Material Safety Data Sheets, for hazardous chemicals are supplied to users to communicate information on the safe use of and hazards of each product. SDS's are supplied by the _____.
 A. USDA
 B. FDA
 C. OSHA
 * D. Manufacturer of the product
32. A soil that contains roughly equal amounts of sand, silt, and clay is called a(n):
 * A. Loam
 B. Textured soil
 C. Permeable soil
 D. Silty clay sandy loam
33. When a soil sample of a lawn is taken, be sure to take sample cores from all areas of the yard with cores about ____ inches deep.
 A. 3
 * B. 6
 C. 12
 D. 18
34. For a tree to shade the home from the afternoon sun in summer, plant the tree on the ____ side of the house.
 A. North
 B. East
 C. Northwest
 * D. Southwest
35. Large growing trees, taller than sixty feet, should be planted at least ____ feet from the foundation of a home.
 A. 8
 B. 10
 C. 12
 * D. 20
36. Which of these actions is most likely to stimulate the growth of lateral buds on a shrub or tree?
 A. Removal of the stamens
 B. Removal of the anthers
 * C. Removal of the terminal buds
 D. Spraying the plant with an organic pesticide
37. When removing large branches from trees the ____ method should be used. This prevents damage caused by the weight of the branch ripping down and stripping bark off the tree trunk.
 A. Straight-cut

- B. Two-cut
 - * C. Three-cut
 - D. Four-cut
38. The air space on a spark plug between the electrodes is set with a tool called a(n):
- A. Plug knife
 - B. Electrode prod
 - * C. Gap gauge
 - D. Terminal gauge
39. Which of these practices will encourage lawn grasses to become more deeply rooted?
- * A. Deep watering only as needed.
 - B. Light watering each morning.
 - C. Heavy watering each morning.
 - D. Watering each morning and afternoon.
40. The best example listed of a variable cost for a nursery grower is:
- A. Liability insurance
 - B. Land payments
 - * C. Cost of potting soil
 - D. Truck payment
41. A customer wants a flowering annual for their landscape in Indianapolis that can withstand the heat of full sun conditions during the summer. They will host a wedding at their home in mid-summer and they want a blooming annual that will provide excellent color at that time. Which of these choices would be the best plant to suggest to this customer?
- A. clematis
 - B. snapdragons
 - * C. marigolds
 - D. pansies
42. One of the responsibilities of this Federal agency is to protect U.S. agriculture and natural resources against invasive pests and diseases.
- A. American Community and Workplace Administration
 - B. Occupational Safety and Health Administration
 - C. Cooperative Extension Service
 - * D. Animal and Plant Health Inspection Service
43. A nursery business owner realized that her equipment is not worth as much this year as it was last year, or any year since she purchased the equipment. The measure of how much a piece of equipment drops in value each year is called:
- A. maintenance appreciation loss.
 - B. consumable routing.
 - * C. depreciation.
 - D. asset routing.
44. Anyone who plans to dig, including landscapers and homeowners, should call ____ or go to their state call-before-you-dig website to request that the approximate location of buried utilities be marked with paint or flags so that they don't unintentionally dig into an underground utility line.

- A. 911
 - * B. 811
 - C. 711
 - D. 611
45. A pesticide that warns against dermal contact indicates that precautions against contact with ___ should be taken.
- A. hands
 - * B. skin
 - C. face
 - D. arms
46. Which of the following pests gives birth to live young and can multiply at an alarming rate?
- * A. Aphids
 - B. Whiteflies
 - C. Leaf miners
 - D. Spider mites
47. Which of these are current trends that many landscape customers are interested in and often request?
- A. Permeable paving and rainwater harvesting
 - B. Drought tolerant and native plants
 - C. Graywater harvesting and reduced lawn areas
 - * D. All the above
48. If a fertilizer has an 18-5-12 analysis, how much phosphorus is in a 50-pound bag of this fertilizer?
- A. 12 pounds
 - B. 5 pounds
 - C. 18 pounds
 - * D. 2.5 pounds
49. If you plan to start a nursery you will need to contact this governmental agency to obtain a license to ensure that your plants don't contain pests or diseases.
- A. FDA
 - * B. State Department of Agriculture
 - C. APHIS
 - D. OSHA
50. These plants are grown from seeds or cuttings. They are very young plants, usually grown for sale to other nurseries, who grow them to a larger size before selling them to consumers. This is the best definition for _____ in horticultural terms.
- A. Pullers
 - * B. Liners
 - C. Yearlings
 - D. Inserts

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KEY

2023

Directions: Select the best answer for each item and mark your selection on the answer sheet provided. Using a #2 pencil, completely darken the letter on the answer sheet that corresponds to your answer for each item.

1. What is the primary purpose of a propagation nursery?
 - A. Landscape conservation and plant health
 - B. Plant conservation and preservation
 - * C. Reproduction of landscape plants
 - D. Soil erosion prevention and plant production

2. Which of the following correctly identifies the equation for photosynthesis in the presence of light energy?
 - A. $C_6H_{12}O_6 + O_2 \rightarrow CO_2 + H_2O \rightarrow CO_2$
 - B. $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2 \rightarrow H_2O \rightarrow \text{Energy}$
 - * C. $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$
 - D. $CO_2 + H_2O \rightarrow C_9H_{12}O_9 + H_2O + CO_2$

3. Which of the following is a recommended retail sales technique?
 - * A. Place the item in the customers hands as the product is discussed, if practical.
 - B. Create desire by not allowing the customer to hold the item until they appear ready to purchase.
 - C. Create anticipation and desire by talking about the item as you point to it on the shelf.
 - D. Direct the customer to items for add-on sales first, then redirect them to the original item of interest.

4. What is the best definition of landscape renovation?
 - A. The process of establishing a new landscape complete with plants, walks, drives, and other elements.
 - B. The installation of artificial features in a landscape to improve visual appeal.
 - * C. Restoration and improvement of an existing landscape by replacing or renewing plants and other elements.
 - D. Replacing existing plants with new plant cultivars and reorienting them away from prevailing winds.

5. When assisting a customer in a retail store, what is an essential aspect of effective salesmanship?
 - A. Focus on closing the sale quickly and downplaying customer objections to the product.
 - * B. Providing accurate and relevant information about the products or services.
 - C. Avoiding any hint of sales pressure by showing disinterest in the customer's inquiries and concerns.
 - D. Use body language to apply pressure to the customer to make a purchase quickly.

6. Which best describes a pesticide designed to kill weeds before they emerge from the soil?
 - A. Post EM₅₀
 - * B. Preemergence
 - C. LD₅₀ Premerger
 - D. Postemergence

7. The pesticide signal word that indicates the product is moderately toxic is
 - * A. Warning
 - B. Caution
 - C. Danger
 - D. Modicum

8. Which of these is an important business financial record to maintain to help predict income and expenses, especially so that the business can meet financial obligations during specific time periods?
- A. Net worth statement
 - B. Inventory statement
 - C. Equipment depreciation
 - * D. Cash flow statement
9. Which of the turfgrasses listed are best suited for golf course putting greens?
- A. Kentucky 31 tall fescue
 - B. Kentucky bluegrass
 - * C. Bermudagrass
 - D. Annual bluegrass
10. A homeowner had a tree removed and the stump ground down to well below the soil surface. They then installed bermudagrass sod in the yard, including where the tree had been located. The grass grew well and looked great except over the area where the tree once grew. In this area the grass grew poorly and was a yellowish color. Which of these best explains what caused this problem?
- * A. Soil microorganisms feeding on the wood chips left in the soil, are using the available nitrogen in order to digest the chips, leaving the grass a yellowish color.
 - B. Heavy machinery was probably used to grind the stump, compacting the soil in that area and delaying nitrogen and phosphorus uptake by the grass.
 - C. The stump grinding process loosed the soil excessively over the stump, limiting the penetration on grass roots and ultimately limiting nitrogen uptake.
 - D. The stump grinding machinery left a slight fossil fuel residue, contaminating the immediate area around the stump, causing temporary yellowing of the grass.
11. A customer requests a plant that can be grown on or tightly against a wall in his garden. Many plants, including vining plants, can be trained for use in this manner. What garden term of French origin is used to describe a tree or shrub whose branches are trained to grow against a wall or fence?
- A. Amour
 - B. Arbre
 - * C. Espalier
 - D. Jardin
12. Which of the following best describes depreciation of equipment?
- A. A method of calculating the long-term value of equipment.
 - B. A method of prorating the cost of labor to operate equipment over a given time period.
 - C. A method of calculating funds that will be received for equipment services.
 - * D. A reduction in the value of a piece of equipment, usually due to age and wear.
13. After a few days of heavy rain, a homeowner noticed circles of mushrooms in her yard. This phenomenon is called fairy ring. Which of these is NOT an accurate statement about fairy ring mushrooms?
- A. This fungi feeds off stumps, roots, and other organic matter left in the ground.
 - B. The mushrooms seen in the ring are the fruiting bodies of fungi that live underground.
 - C. The mushrooms seen above ground produce fungal spores that spread in the wind.
 - * D. The mushrooms should be sprayed with an antibacterial to prevent spread of the fungus.
14. What is the primary purpose of landscape lighting?
- A. To attract insects to a central location for natural pest control.
 - * B. To create a safe, aesthetic, and inviting environment.
 - C. To increase photosynthesis and water efficiency.
 - D. To create a beautiful landscape while discouraging nighttime wildlife.

15. Azaleas prefers a slightly more acidic soil than many landscape plants. The desirable pH range for azaleas is from:
- A. 2.5 to 4.0
 - * B. 4.5 to 6.0
 - C. 6.5 to 7.5
 - D. 7.5 to 8.0
16. Damping-off of seedlings is caused by several soil-borne fungi and molds including Pythium, Phytophthora, Rhizoctonia, and Fusarium. Conditions under which organisms causing damping-off thrive include:
- * A. Cool and wet conditions.
 - B. High light exposure and warm temperatures.
 - C. Low soil pH and high humidity.
 - D. High pH and low humidity.
17. Nitrogen is one of the most important plant nutrients applied as fertilizer. Which of the following statements regarding nitrogen fertilizer is accurate?
- A. Always apply nitrogen according to the soil pH.
 - * B. Nitrogen is readily lost from the soil, especially with excessive rain or irrigation.
 - C. The rate of nutrient application should be based on a ratio of 10-10-10.
 - D. The recommended application rate of phosphorus in soil test results is used to calculate the nitrogen ratio.
18. Which of these landscape materials is most limited in the time of year that they can be planted? These items are generally restricted to late fall through early spring plantings for the highest success rate.
- * A. Bare-root shrubs and trees.
 - B. Containerized shrubs and trees less than 5 gallons.
 - C. Flowering vines and trees.
 - D. Herbaceous perennial plants.
19. If a fertilizer bag has 5-10-15 printed on the bag, which of these can be determined from those numbers alone?
- A. The bag of fertilizer weighs 30 pounds.
 - B. The bag of fertilizer contains 15 percent nitrogen.
 - * C. The bag of fertilizer contains 10 percent phosphorus.
 - D. All the above are true.
20. Which of the following describes a potential issue associated with soil that has a high sand content?
- A. The small particles of sand pack together tightly and limits the space available for roots to grow.
 - * B. The large particles of sand provides good air space but allows water to drain too quickly.
 - C. The various sizes of sand particles create an uneven water balance throughout the soil profile.
 - D. The large particles of sand may cause surface flooding by inhibiting drainage.
21. What should be the first step when handling pesticides in a nursery or landscape operation to ensure safety?
- A. Obtain and wear 100% cotton gloves and clothing.
 - * B. Read the product label and follow the instruction.
 - C. Mix the pesticide with water to activate it quickly and safely.
 - D. Check the air temperature in the pesticide storage area.
22. Which of the following correctly identifies the three general areas of a home landscape?
- A. Drive, walks, and play areas
 - B. Commercial, residential, and private areas
 - * C. Public, private, and service areas
 - D. Service, communal, and public areas

23. The client requested color beds in the landscape to compliment the color of the building and company logo. The designer selected annual plants with blooms of the same hue, tone, and shades. This type of color scheme is best described as:
- * A. Monochromatic
 - B. Analogous
 - C. Complementary
 - D. Triadic
24. When propagating landscape plants from softwood cuttings, which of the following equipment would be most helpful to support the unrooted cutting until adventitious roots emerge to support the new plant?
- A. A soil aerator
 - B. A fertilizer injector
 - C. A planting dibble
 - * D. A mist propagation system
25. Some plants have the ability to grow on objects such as walls, fences, and around stakes. These climbing plants and vines throw out tendrils, which are a response to a touch stimulus. This is best termed:
- * A. Thigmotropism
 - B. Heliotropism
 - C. Hydrotropism
 - D. Phototropism

End
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2024 Written Exam

KEY

Directions: Select the best answer for each item and mark your selection on the answer sheet provided or as directed. Using a #2 pencil, completely darken the letter on the answer sheet that corresponds to your answer for each item.

1. Why is the proper spacing of plants in a nursery important?
 - A. To reduce soil erosion and conserve fertilizer
 - * B. To improve air circulation and encourage desirable growth
 - C. To reduce the temperature of the growing area and to provide shade
 - D. To limit plant growth and reduce soil erosion

2. What does the presence of mushrooms growing on the base of a tree typically indicate?
 - A. The tree is healthy and thriving
 - B. The tree is producing new roots
 - * C. The tree is in poor health
 - D. The tree is entering the propagation phase

3. Which of the following plant tissues is responsible for the transport of water and minerals from the roots to other parts of the plant?
 - A. Phloem
 - B. Nodes
 - C. Epidermis
 - * D. Xylem

4. Which of the following best describes the function of a spark plug in a small gasoline engine?
 - A. To vent the combustion chamber before ignition
 - B. To regulate the air-fuel mixture ratio in the combustion chamber
 - C. To filter out impurities in the air before it enters the combustion chamber
 - * D. To ignite the air-fuel mixture in the combustion chamber

5. What does the USDA Plant Hardiness Zone Map help horticulturists determine?
 - A. The best time to prune plants
 - B. The drought tolerance of each region
 - * C. The coldest temperatures a plant can tolerate in a specific area
 - D. The amount of sunlight a plant needs

6. What is the primary purpose of hardening off seedlings before moving them from a greenhouse or cold frame and transplanting them outdoors?
 - A. To reduce their susceptibility to pests
 - B. To increase root growth
 - * C. To acclimate them to outdoor conditions
 - D. To prevent flowering

7. Which of the following statements about postemergence herbicides is most accurate?
 - A. Postemergence herbicides prevent weed seeds from germinating
 - * B. Postemergence herbicides are applied after weeds emerge
 - C. Postemergence herbicides only work on weeds in the germination stage
 - D. Postemergence herbicides are applied to weeds in the late winter before new plant growth

8. A customer at the nursery was assisted by a salesperson in selecting pruning shears. The customer was initially drawn to an inexpensive pruner designed for small limbs. After learning more about the scope of the job, the salesperson suggested a larger, higher-quality pruner to better suit the customer's needs. This is best described as:
- A. Bundling
 - * B. Upselling
 - C. Price promotion
 - D. Price inversion
9. Which of the following plant propagation techniques allows a nurseryman to produce new plants that are genetically the same as the parent plant?
- A. Hybridization
 - * B. Rooting cuttings
 - C. Sexual propagation
 - D. Pollination
10. Which of the following techniques is most likely to improve communication skills in a team meeting?
- A. Multitasking and dividing attention
 - B. Avoiding too much eye contact to maintain focus on written content
 - * C. Demonstrating active listening, taking notes, and summarizing key points
 - D. Using the highest-level vocabulary during discussions
11. The OSHA Hazard Communication Standard requires pesticide manufacturers, distributors, and importers to provide Safety Data Sheets (SDS) for each hazardous chemical sold. What is the primary purpose of the Safety Data Sheets?
- A. To instruct retailers on the safe display of hazardous materials in the store
 - * B. To help downstream users understand the hazards associated with the chemical
 - C. To provide information on chemical pricing and availability
 - D. To assure compliance with distribution and wholesale policies
12. Which of the following would be most likely to increase a nursery grower's chances of making a profit?
- A. Increasing fixed costs
 - B. Decreasing the selling price of plants produced
 - C. Increasing taxes
 - * D. Decreasing variable costs
13. Which of the following is a key benefit of using a cold frame or greenhouse in the production of nursery plants?
- A. Decreases insect infestations
 - B. Decreases plant susceptibility to disease
 - * C. Provides a controlled growing environment
 - D. Reduces water use
14. Peat moss is commonly used in growing media for potted crops and as a soil amendment in the landscape. What is the primary purposes of peat moss?
- A. Provide essential nutrients and reduce erosion
 - * B. To retain moisture and improve aeration
 - C. Provide micro nutrients and reduce pH
 - D. To increase pH of the soil and prevent disease
15. What are the primary purposes of pruning young plants in nursery production?
- A. To maximize the number of plants that can be grown in a given space
 - B. To reduce water and fertilizer use by the plants
 - C. To discourage flowering and increase vegetative growth
 - * D. To shape the plant and promote proper growth

16. Which of the following plant nutrients is primarily responsible for promoting vegetative growth?
- * A. Nitrogen
 - B. Potassium
 - C. Phosphorus
 - D. Calcium
17. Which of the following is a gardening practice that promotes the continued blooming of plants in the landscape?
- * A. Dead heading
 - B. Air layering
 - C. Node removal
 - D. Root pruning
18. Which of the following are benefits of using mulch around plants in the landscape?
- * A. It conserves soil moisture, moderates temperatures, decreases weed growth
 - B. It eliminates weeds, reduces loss of air from the soil, increases temperature
 - C. It lowers soil temperature, reduces insect problems, eliminates weeds
 - D. It decreases pests, maintains a constant soil temperature, increases beneficial insects
19. Which of the following is the best definition of spring and summer flowering perennials?
- * A. They live many year, the tops die back to the ground each fall and growth arises from the crown or roots in the spring
 - B. They bloom during the spring and summer, the tops and roots die after flowering, they grow again in the spring from the seeds produced the previous season
 - C. The leaves and tops persist throughout winter, they bloom during the summer and fall, they are hardy in all USDA hardiness zones
 - D. The parent plant lives for two years, they show little growth during the winter, they have a two-year life cycle
20. Some nursery growers use a science-based process that combines several tools and strategies to identify and manage pests. They use a combination of biological, mechanical, cultural, and chemical practices to control pests. Which of these best describes this pest management control system?
- A. Organic Nursery Production (ONP)
 - B. Pseudo-Pest Management (PPM)
 - * C. Integrated Pest Management (IPM)
 - D. Scientific Organic Pest Control (SOPC)
21. Which of the following is a warm season turfgrass, commonly used in residential lawns and commercial applications, but has little shade tolerance?
- * A. Bermudagrass
 - B. Annual bluegrass
 - C. Miscanthus grass
 - D. Kentucky bluegrass
22. What of these best defines hardscapes items as used in landscape design?
- * A. Non-living elements such as pathways, patios, or retaining walls
 - B. Structures that add outdoor living space
 - C. Natural elements such as trees, shrubs, and flowers that enhance the beauty of the landscape
 - D. Artistic and decorative elements, such as topiaries that add flair to the landscape
23. A well-designed public area in a home landscape should do which of the following?
- A. Emphasize the length of the home with low growing plants at each corner of the landscape
 - * B. Draw the viewer's eye to the as the front entry area of the home
 - C. Create a commons area with no emphasis on any particular area of the landscape
 - D. Provide the observer a full view of home's features from side to side

24. Which pesticide signal word indicates that the material is moderately toxic?
- * A. Warning
 - B. Caution
 - C. Danger
 - D. Poison
25. Which of these is not a defined method of pesticide exposure?
- A. Inhalation
 - B. Dermal
 - C. Oral
 - * D. Congestion
26. Which of the following best describes depreciation of nursery and landscape equipment?
- A. Depreciation is a method of calculating the future value of equipment
 - * B. Depreciation is the decrease in the value of a piece of equipment over a period of time
 - C. Depreciation is a method calculating the amount of money that will be received in future
 - D. Depreciation is a method calculating the change in variable cost over a period of time
27. When is the best time to prune summer-flowering shrubs?
- A. early summer
 - * B. late winter
 - C. mid-summer
 - D. they may be pruned anytime because these shrubs bloom on old and new growth
28. Which of these practices is often used to help speed up the rooting of cuttings?
- A. Maintaining the soil temperature between 65 and 70 degrees
 - B. Providing air movement with circulation fans
 - C. Applying extra fertilizer in liquid form
 - * D. Providing bottom heat
29. Which of these is a soil type that contains a combination of sand, silt, and clay particles in relatively equal amounts?
- A. sandy soil
 - B. silty soil
 - C. clay soil
 - * D. loamy soil
30. Some plants are difficult to root and require extra processes to increase the percent of rooting. Which of the following is a common practice to increase the rooting success rate?
- A. Spraying the wound at the base of the cutting with wound spray
 - B. Removing the growth buds from the cutting
 - * C. Wounding the cutting at the base to increase surface area
 - D. Treating the wound at the base of the cutting with pesticide

End
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Nursery and Landscape CDE
2025 Written Exam

Directions: Select the best answer for each item and mark your selection as directed.

1. Which of the following groups of landscape plants are all commonly propagated by division?
 - A. Rose, Boxwood, Azalea, Juniper
 - B. Zinnia, Marigold, Petunia, Salvia
 - * C. Hosta, Ajuga, Daylily, Liriope
 - D. Ficus, Quercus, Acer, Ilex
2. Why is turning and mixing materials in a home garden compost pile important?
 - A. It helps prevent and discourage insect problems in the pile
 - B. It helps retain moisture inside the pile to maintain even heating
 - * C. It introduces oxygen and helps ensure that aerobic processes continue
 - D. It cools the material and helps speed up the aerobic process
3. A homeowner complains that the junipers they planted last year are not growing well. The plants have grown slowly, the foliage is not dense, they have poor color and generally appear unhealthy. Which of the following environmental conditions is most likely contributing to the junipers' poor performance?
 - A. Little or no fertilizer applied at planting
 - B. Planting on a southern slope with excessive sunlight
 - C. Too much soil amendment added in the planting hole
 - * D. Planting in dense shade, limiting photosynthesis
4. Which of the following is the most important advantage of adding composted organic materials to a landscape garden?
 - A. It increases the need for and utilization of chemical fertilizers
 - B. It creates a hard surface layer that increases water infiltration
 - C. It helps eliminate weed seeds and plant pathogens in the soil
 - * D. It improves soil structure, moisture retention, and nutrient availability
5. Which of the following best describes cross-pollination?
 - A. Pollen transferred from the anther to the stigma of the same flower
 - B. The transfer of pollen from the stigma of one flower to the anther of another flower
 - * C. Pollen transferred from one plant's anther to the stigma of another plant of the same species
 - D. The process by which plants produce seeds without the transfer of pollen
6. Which human activity is most likely to negatively impact pollinators in ecosystems?
 - A. Destruction of native flowering plants
 - B. Clear cutting of forest lands
 - C. Loss of topsoil from wind erosion
 - * D. Widespread use of pesticides in agriculture
7. If the blooms on a hydrangea are pink, which of the following is most likely true about the soil?
 - A. The soil is acidic (low pH)
 - B. The soil has a high nitrogen content
 - * C. The soil is neutral or alkaline (higher pH)
 - D. The soil is deficient in phosphorus

8. A landscaper plants four types of annuals in the landscape to provide fall color. After the plants become established and begin blooming, unexpected freezing temperatures and snowfall affects the area. After a couple of days the weather returns to mild, more normal temperatures. Which of the following plants is most likely to survive and continue blooming?
 - A. Impatiens
 - B. Begonias
 - * C. Pansies
 - D. Coleus
9. A customer's home is nestled in a heavily wooded area with large mature trees on every side of the house, providing cooling shade for the entire landscape during the summer. Which of these plant materials would be least appropriate for the landscape of this home?
 - * A. Bermudagrass
 - B. Lenten rose
 - C. Hosta
 - D. Ajuga
10. What is the primary purpose of hardening off seedlings before moving them from the greenhouse propagation area to the outdoor nursery growing area?
 - A. To increase water absorption
 - B. To speed up flowering
 - C. To increase resistance to pests
 - * D. To acclimate them
11. Which of the following soil types is most likely to be described as fine in texture?
 - A. Sandy loam
 - * B. Clay loam
 - C. Loamy sand
 - D. Coarse sand
12. Why is product knowledge in the garden center industry critical in retail sales?
 - A. It reduces the need for customer interaction as most questions can be answered at the register
 - * B. It builds credibility and helps match products to customer needs
 - C. It minimizes inventory management
 - D. It maximizes inventory management
13. A customer in the garden center is indecisive between two products. What should the salesperson do?
 - A. Tell the customer which product they should choose to save time for both the customer and the salesperson
 - B. Criticize one product to simplify the customer's decision
 - C. Add in a third item, similar to the first two items for consideration
 - * D. Compare the pros and cons of each item based on the customer's needs
14. What is the general effect on plants when high-nitrogen fertilizer is applied in excess?
 - * A. Excessive vegetative growth and reduced flowering
 - B. Improved flowering and more vegetative growth
 - C. Drought tolerance due to deeper root penetration
 - D. Pest resistance due to pest avoidance of vegetative growth
15. How is stratification carried out to prepare seeds for germination in nursery crop production?
 - * A. Seeds are exposed to a cold, moist environment for a specific period of time to break seed dormancy
 - B. Seeds are soaked for a period of time, based on the hardness of the seed coat, to break seed dormancy
 - C. The seeds are physically broken to stimulate germination and break dormancy
 - D. Seeds are exposed to an extended dry period, followed by soaking under pressure

16. A nurseryman recommended the homeowner plant three 'Blue Princess' meserveae hollies and one "Blue Prince" meserveae holly. What is the most likely reason for this combination?
- * A. Meserveae hollies are dioecious
 - B. Blue Prince holly has better color and is often used as a focal point
 - C. Meserveae hollies are monoecious
 - D. The Blue Prince holly will provide contrast while maintaining simplicity
17. Which of the following groups all contain recognized principles of landscape design?
- A. Balance, Unity, Coordination
 - * B. Proportion, Rhythm, Unity
 - C. Focalization, Scale, Alignment
 - D. Simplicity, Variety, Cycle
18. Which of these is the best definition of composting?
- A. The process of refined growing methods using inorganic plant material
 - B. Mixing soil with animal manure, fertilizer and other inorganic matter
 - * C. Breaking down organic matter into a nutrient-rich soil amendment
 - D. Recycling inorganic and organic matter into reusable plant nutrients
19. Which group consists entirely of beneficial insects?
- * A. Wasps, lacewings, and praying mantis
 - B. Praying mantis, spiders, and snails
 - C. Increment borers, grubs and leafhoppers
 - D. Spiders, ticks, and borers
20. Which scenario would create the least favorable conditions for plant disease development, helping to prevent disease outbreaks in nursery crops?
- A. High humidity, warm temperatures, and dense plant spacing
 - * B. Moderate temperatures, low humidity, and good sanitation practices
 - C. Fluctuating temperatures, intermittent irrigation, and good sanitation practices
 - D. Cool temperatures, dry soils, and high humidity
21. Which group of plant diseases or disorders listed below are all caused by a fungus?
- A. Powdery Mildew, Apple Scab, Fire Blight
 - B. Anthracnose, Canker, Crown Gall
 - C. Fire Blight, Botrytis, Root Rot
 - * D. Cedar Apple-Rust, Black Spot, Anthracnose
22. On push lawnmowers, a safety feature called a blade control or operator presence lever is held against the handle during operation. What happens when the lever is released?
- * A. It shuts off the engine and stops the blade
 - B. It engages the self-propel drive to move the mower forward
 - C. It raises the cutting deck to its highest position and stops the blade immediately
 - D. It activates the mower's choke and sparkplug for easier re-starting once the operator returns
23. Which of the following practices is most likely to promote bushier, more compact growth in ornamental shrubs?
- A. Heavy fertilization with high-nitrogen fertilizer to stimulate rapid shoot elongation
 - * B. Selective heading back of stems to encourage lateral bud development
 - C. Frequent deep irrigation to promote extensive root growth and taller top growth
 - D. Close plant spacing to maintain natural apical dominance and growth

24. Which of the following nutrients is most commonly applied to prevent or correct interveinal chlorosis in landscape plants?
- A. Potassium (K) – supplied as potassium sulfate or muriate of potash
 - * B. Iron (Fe) – supplied as chelates or soil drenches
 - C. Phosphorus (P) – supplied as superphosphate or bone meal
 - D. Nitrogen (N) – supplied as urea or ammonium nitrate
25. The term LD₅₀ is sometimes used in the description of pesticides and pesticide research. Which of the following best defines LD₅₀ used in this context?
- A. A scientific technique used to track insect populations
 - B. A process for determining the most effective way to apply pesticides for 50% control of a pest population
 - C. A system for describing weather patterns that affect pesticide use
 - * D. A measure of the amount of pesticide required to kill 50% of a test population
26. In landscape construction, weep holes are often incorporated into retaining walls. What is their primary function?
- A. To anchor the wall more securely to its foundation and prevent shifting
 - * B. To allow water to drain from behind the wall, reducing hydrostatic pressure and soil saturation
 - C. To increase airflow behind the wall to prevent mold growth on the soil surface
 - D. To stabilize the topsoil by promoting root growth near the base of the wall
27. In residential landscape design, the recommended minimum width for a front walkway should allow for comfortable, side-by-side pedestrian movement and accessibility. Which of the following dimensions best meets this standard?
- A. 18 to 24 inches
 - B. 24 to 30 inches
 - * C. 36 to 48 inches
 - D. 60 to 72 inches
28. Why is knowing a plant's hardiness zone especially important when selecting perennial landscape plants?
- A. It predicts how quickly the plant will grow and flower
 - * B. It indicates whether the plant will survive winter temperatures in a given location
 - C. It determines how often fertilizer applications are needed
 - D. It identifies potential soil nutrient deficiencies in the area
29. Which of these plant hormones is most directly involved in stimulating root formation in stem cuttings used for propagation?
- A. Gibberellin
 - B. Cytokinin
 - C. Abscissic acid
 - * D. Auxin
30. Spring-flowering shrubs such as lilac, forsythia, and azalea should be pruned at what time of year to maximize flower production the following year?
- A. Late winter, before new growth begins
 - * B. Immediately after flowering is complete in spring
 - C. Mid-summer, during peak vegetative growth
 - D. Early fall, before dormancy begins

End
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