PRACTICE EXAM 20: ISA CERTIFIED ARBORIST SIMULATION

QUESTIONS 1–200

Time limit: 3 hours 30 minutes. Each question has exactly one correct answer.

1. Which tissue is responsible for adding new wood to a tree each year?

A. The central pith at the trunk's core

B. The outer corky bark layer

C. The inner heartwood cylinder

D. The vascular cambium between wood and bark

2. What is the primary function of phloem in a mature trunk?

A. Conduction of water upward from the roots

B. Transport of sugars from sources to sinks

C. Structural support in the heartwood cylinder

D. Storage of the tree's primary reserves

3. Which mechanism pulls water upward through a tree's xylem?

A. Transpiration tension and cohesion of water molecules

B. Active metabolic pumping by root cells

C. Atmospheric pressure pushing upward from soil

D. Osmotic gradients in the outer bark

4. What happens to a tree's rate of photosynthesis when stomata close during drought?

A. It increases sharply in response to stress

B. It remains completely unchanged during closure

C. It decreases because CO_2 cannot enter the leaf

D. It shifts entirely to respiration-based output

5. Which CODIT wall is formed by the cambium after wounding?

A. Wall 1 plugging vertical xylem vessels

B. Wall 4 formed at the wound margin

C. Wall 2 crossing the annual growth rings

D. Wall 3 formed within the ray tissue

6. What is the main role of mycorrhizal fungi on tree roots?

A. Fixing atmospheric nitrogen into ammonia

B. Producing antibiotics against soil pathogens

C. Decomposing dead wood in the forest floor

D. Extending the effective absorbing surface area

7. When do a deciduous tree's carbohydrate reserves typically reach their annual low?

A. Late spring after refoliation is complete

B. Mid-summer at peak photosynthesis

C. Early autumn before leaf translocation

D. Mid-winter during deepest dormancy

8. What causes girdling roots to eventually decline a mature tree?

A. Absorption of toxic compounds from subsoil

B. Attraction of bark beetles to the base

C. Compression of vascular tissue at the trunk

D. Production of ethylene gas from the roots

9. Where are most of a mature tree's absorbing roots located?

A. Below four feet in the deep subsoil

B. Exclusively within the central taproot

C. Only at the outer edge of the dripline

D. In the upper 12 to 18 inches of soil

10. What is the correct description of heartwood?

A. Active water-conducting tissue of the outer trunk

B. Dead wood with deposited extractives providing decay resistance

C. Living parenchyma storing the tree's starch reserves

D. The most metabolically active layer of the trunk

11. Which hormone produced at the shoot tip suppresses lateral bud growth?

A. Auxin, which enforces apical dominance

B. Ethylene, which ripens fruit tissue

C. Cytokinin, which stimulates cell division

D. Abscisic acid, which induces dormancy

12. What best describes the branch collar?

A. The dead outer bark covering branch bases

B. A raised line of bark on the upper union

C. Swollen stem tissue at the base of a branch

D. The pith cylinder running through the branch

13. What causes sunscald on the south side of a trunk in winter?

A. A fungal infection beneath the bark surface

B. Rapid temperature changes on sunny winter days

C. Excess soil moisture saturating the trunk base

D. Internal decay pushing bark outward

14. What is reaction wood?

A. A decorative grain pattern with no function

B. Decayed wood at the center of the trunk

C. Wood damaged by improper pruning cuts

D. Wood produced in response to mechanical stress

15. How do xylem cells function during water transport?

A. They are dead at maturity and form hollow tubes

B. They actively pump water using cellular energy

C. They divide rapidly throughout the growing season

D. They store starch reserves for winter use

16. What is the primary purpose of leaf stomata?

A. Reproduction through seed dispersal

B. Structural support for the leaf blade

C. Gas exchange between leaf and atmosphere

D. Storage of photosynthetic byproducts

17. Which tree response follows heavy spring defoliation?

A. Immediate boost to carbohydrate reserves

B. Stronger structural wood in remaining branches

C. Permanent dormancy for multiple seasons

D. Severe stress because reserves are already depleted

18. What is the purpose of the branch bark ridge?

A. An internal barrier within heartwood

B. A reference point for correct cut placement

C. The outer corky bark of the mature trunk

D. A dead zone separating sapwood from heartwood

19. Which condition defines a latent bud?

A. A dormant bud held in reserve under the bark

B. An actively growing bud at the shoot tip

C. A flower bud producing reproductive organs

D. A dead bud remnant from the prior season

20. What triggers epicormic sprout formation?

A. Normal seasonal fall color development

B. Low soil moisture during summer months

C. Stress such as topping or severe damage

D. Excess nitrogen from nearby turf fertilizer

21. Which description fits respiration in tree cells?

A. A light-driven sugar production process

B. Continuous consumption of sugars for cellular energy

C. A process that occurs only during daylight hours

D. A process limited to dormant winter periods

22. What distinguishes primary growth from secondary growth?

A. Primary growth thickens trunks through cambial activity

B. Primary growth occurs only in conifers and palms

C. Primary growth happens exclusively in heartwood

D. Primary growth extends shoots and roots in length

23. What is the MAD Horse mnemonic used to identify?

A. Conifers with deciduous needles

B. Trees with distinctive peeling bark

C. Genera with opposite leaf arrangement

D. Species requiring urban planting permits

24. Which leaf feature identifies a white oak?

A. Rounded lobes and one-season acorns

B. Pointed bristle-tipped lobes on the leaf

C. Compound leaves with nine to eleven leaflets

D. Needle-like leaves in bundles of three

25. Which feature identifies a red oak?

A. Rounded lobes without any bristles present

B. Pointed bristle-tipped lobes and two-season acorns

C. Simple toothed leaves with no lobes at all

D. Palmately compound leaves with five leaflets

26. Which tree is a deciduous conifer that sheds needles each autumn?

A. Eastern white pine in mixed forests

B. Eastern hemlock in cool moist sites

C. Eastern red cedar in open fields

D. Bald cypress in southern swamps

27. What is the correct written form of a species name?

A. *Acer rubrum* with genus capitalized and italicized

B. ACER RUBRUM in bold capital letters throughout

C. *acer rubrum* written entirely in lowercase

D. *Acer Rubrum* with both words capitalized

28. What does a plant name in single quotation marks represent?

A. A formally published Latin subspecies under code

B. A wild botanical variety from a natural population

C. A cultivar selected and propagated clonally

D. The common nursery marketing name used informally

29. What does the 10-20-30 rule limit in urban forestry?

A. Canopy cover percentages in three zones

B. Species, genus, and family percentages in plantings

C. Tree heights across three size classes

D. Nursery stock grades for delivery standards

30. Which tree has palmately compound leaves with five leaflets?

A. White ash in the olive family

B. Black walnut in the walnut family

C. Sugar maple in the soapberry family

D. Horse chestnut in the soapberry family

31. Which tree is distinguished by mottled tan and white peeling bark?

A. Sugar maple in northern forests

B. Red oak in mixed eastern forests

C. American sycamore along floodplains

D. Eastern white pine in upland sites

32. What plant family contains *Fraxinus*?

A. Oleaceae, the olive family

B. Rosaceae, the rose family

C. Sapindaceae, the soapberry family

D. Pinaceae, the pine family

33. Which species is appropriate beneath a 25-foot distribution line?

A. Tulip poplar reaching 80 feet at maturity

B. Red oak reaching 70 feet at maturity

C. Pin oak reaching 60 feet at maturity

D. Flowering crabapple reaching 15 to 20 feet

34. Which classification fits tree of heaven (*Ailanthus altissima*)?

A. A federally endangered native species

B. A non-native invasive species in eastern North America

C. A protected understory native species

D. An evergreen conifer with deciduous needles

35. What is the principle of Right Tree, Right Place?

A. Matching mature characteristics to site conditions

B. Selecting the cheapest available nursery stock

C. Planting the largest possible species at every site

D. Using only native species in every landscape

36. What defines a pinnately compound leaf?

A. A single blade with deeply cut lobes

B. Leaflets radiating from one attachment point

C. Leaflets along two sides of a central rachis

D. Leaves in whorls around a single node

37. Which genera are captured in the MAD Horse mnemonic?

A. Oak, hickory, beech, and walnut

B. Maple, ash, dogwood, and horse chestnut

C. Pine, spruce, fir, and hemlock

D. Elm, cherry, birch, and willow

38. What feature best identifies trees during winter?

A. Leaf margin and venation alone

B. Flower fragrance from the previous season

C. Root flare width at the soil surface

D. Bud shape, twig features, and bark character

39. What soil texture best supports most tree species?

A. Loam with balanced sand, silt, and clay

B. Pure clay dominated by fine particles

C. Pure sand with coarse grain structure

D. Pure organic matter without minerals

40. What does a pH of 7.0 indicate?

A. Strongly acidic conditions near the scale minimum

B. Moderately alkaline conditions above neutral

C. Neutral conditions at the scale midpoint

D. A reading entirely off the standard scale

41. What does cation exchange capacity measure?

A. The total depth of the topsoil horizon

B. The average rainfall received annually

C. The daily soil temperature variation

D. The soil's ability to hold and exchange cations

42. What does a bulk density of 1.8 g/cm³ indicate?

A. Ideal loose soil for healthy root growth

B. Severe compaction that halts most root growth

C. High cation exchange capacity in the profile

D. Improved drainage through the soil layers

43. What percentage of an ideal mineral soil is pore space?

A. Approximately 50 percent of total volume

B. Approximately 10 percent of total volume

C. Approximately 75 percent of total volume

D. Approximately 90 percent of total volume

44. Why is composite soil sampling preferred?

A. It requires no specialized sampling tools

B. It is much less expensive to process

C. It averages variation across the sampled site

D. It takes less field time than single samples

45. What does a 36-hour perc test drain time indicate?

A. Ideal drainage for any tree species

B. Excessive drainage drying roots rapidly

C. Soil composed entirely of coarse sand

D. Drainage inadequate for most tree species

46. What causes iron chlorosis in pin oak on alkaline soil?

A. Excess nitrogen from adjacent turf areas

B. High soil pH rendering iron unavailable

C. Potassium toxicity in the rooting zone

D. Calcium excess from previous over-liming

47. What is the correct mulch ring specification around a landscape tree?

A. Eight to ten inches piled against the trunk

B. A thin dusting less than half an inch deep

C. Two to four inches deep with the trunk clear

D. Plastic sheeting topped with decorative stone

48. How does soil compaction damage tree roots?

A. Reduces pore space and oxygen available to roots

B. Increases oxygen delivery to the deepest roots

C. Improves drainage across the entire profile

D. Enhances root penetration at all depths

49. Can soil texture be meaningfully changed by amendments?

A. Yes, with enough sand added to any clay

B. Yes, with hydrogen peroxide treatments

C. Only during the dormant season period

D. No, texture is essentially permanent

50. Which amendment raises soil pH?

A. Elemental sulfur applied to the surface

B. Agricultural lime neutralizing acidity

C. Fresh organic mulch without any minerals

D. Hydrogen peroxide applied to the soil

51. Where should the root flare sit on a newly planted tree?

A. At or slightly above the surrounding grade

B. Six inches below the finished grade

C. Twelve inches below the lawn surface

D. Completely buried beneath four inches of mulch

52. What backfill material is current best practice?

A. Sterilized purchased potting mix only

B. Coarse builder's sand with added lime

C. The unamended native soil from the hole

D. Equal parts peat moss and perlite mixed

53. How wide should a planting hole be?

A. Exactly the diameter of the root ball

B. Two to three times the root ball diameter

C. Half the diameter of the root ball

D. Ten times the diameter of the root ball

54. How long does tree establishment typically take?

A. One month regardless of caliper at planting

B. Ten years regardless of caliper at planting

C. Six months with adequate irrigation

D. Approximately one year per inch of caliper

55. When should staking be removed from a newly planted tree?

A. Within one growing season in most cases

B. After a minimum of three to five years

C. Only after the tree reaches full maturity

D. Permanently for the life of the tree

56. What should be done with a circling root found at container planting?

A. Leave it intact to avoid damage

B. Coat it with commercial rooting hormone

C. Cut or straighten it before planting

D. Wrap it in protective burlap

57. What is the correct action with a wire basket on a B&B tree?

A. Leave the entire basket intact for support

B. Remove the entire basket before lowering

C. Replace the basket with plastic mesh

D. Cut and remove at least the upper portion

58. How should a B&B tree be lifted into its hole?

A. By grasping the trunk firmly with two hands

B. By supporting the root ball from underneath

C. By pulling on the burlap at the top

D. By wrapping the crown with lifting straps

59. What is the correct establishment watering practice?

A. Flooding the hole daily for one month

B. Keeping the root ball completely dry

C. Keeping the root ball consistently moist but not saturated

D. Watering only the south side of the trunk

60. Should a newly planted tree be fertilized during its first growing season?

A. No, fertilization is generally unnecessary

B. Yes, heavy nitrogen should be applied

C. Yes, through monthly foliar sprays

D. Yes, as a required planting step

61. When is the best time to transplant a deciduous tree?

A. Mid-summer during peak active growth

B. Any month with adequate irrigation

C. Immediately after leaf expansion

D. Dormancy in late fall or early spring

62. What is the purpose of advance root pruning?

A. Reducing the future root ball weight only

B. Developing new fibrous roots inside the future ball

C. Preventing future trunk sprouting

D. Eliminating the need for irrigation

63. Why should twine at the trunk of a B&B tree be removed at planting?

A. It can girdle the trunk as the tree grows

B. It prevents proper settling of the root ball

C. It must be returned to the nursery for credit

D. It interferes with chemical bark signals

64. What is the correct cut placement for pruning?

A. Flush with the parent stem for smoothness

B. Six inches beyond the branch collar

C. Just outside the branch collar and bark ridge

D. At the exact midpoint of the branch length

65. Why is topping harmful to trees?

A. It costs more than proper reduction cuts

B. It creates large wounds, depletes reserves, and produces weak sprouts

C. It requires specialty equipment most crews lack

D. It is prohibited only in certain states

66. What is the purpose of the first cut in the three-cut method?

A. Reducing total time to cut each branch

B. Allowing use of a smaller chainsaw bar

C. Eliminating need for tool sharpening

D. Preventing bark from tearing down the trunk

67. Which pruning objective targets dead, dying, diseased, broken, and weak branches?

A. Cleaning, the most common routine objective

B. Raising to provide vertical clearance

C. Reducing to lower the crown height

D. Restoring after previous storm damage

68. What is a reduction cut?

A. A flush cut against the parent stem

B. A heading cut leaving an arbitrary stub

C. A cut to a lateral large enough to assume the terminal role

D. Any cut made with a chainsaw

69. When is structural pruning most beneficial?

A. During the final decade of mature life

B. Only during the first month after planting

C. Every autumn after leaf fall occurs

D. During the juvenile growth phase

70. What is the general maximum live foliage removal for a mature tree in one session?

A. 25 to 30 percent during active growth

B. 10 to 15 percent, less for stressed trees

C. 50 percent during the dormant season

D. There is no upper limit for healthy trees

71. What is the branch bark ridge?

A. An internal barrier within the heartwood

B. The outer corky bark of mature trunks

C. A raised line of bark on the upper union

D. A dead separation layer within sapwood

72. What is lion-tailing?

A. A harmful practice stripping interior foliage

B. A proper application of the thinning objective

C. A standard cleaning method under ANSI A300

D. A technique used only for dormant pruning

73. How does pollarding function?

A. As a one-time heading at random heights

B. As a form of topping with no maintenance

C. As a technique limited to conifers

D. As a long-term system with repeated cuts

74. What does restoration pruning address?

A. Recently planted trees during establishment

B. Trees topped, vandalized, or storm damaged

C. Historic specimens designated by ordinance

D. Trees scheduled for immediate removal

75. What does subordination pruning accomplish?

A. Reducing a competing stem in favor of a leader

B. Complete removal of the central leader

C. Removal of all epicormic sprouts

D. Cutting every branch to equal length

76. What damage does a flush cut cause?

A. It leaves a projecting stub to decay

B. It uses excessive tool force on wood

C. It removes the branch collar and Wall 4 tissue

D. It produces a perfectly healed wound

77. What is wrong with a stub cut?

A. It heals faster than any other cut

B. It leaves dead wood that cannot be compartmentalized

C. It produces the strongest wound response

D. It is required for dead branch removal

78. Which tool is correct for cutting live branches under one inch?

A. Anvil pruners that crush the wood

B. A top-handle chainsaw for speed

C. A pole pruner with hook attachment

D. Bypass hand pruners with sharp blades

79. When is a pole pruner most appropriate?

A. For small branches out of reach without climbing

B. For branches over six inches in diameter

C. For all lower scaffold branches on mature trees

D. For felling small trees on flat ground

80. How should a crew respond to a client requesting 50% live foliage removal?

A. Comply using bypass hand pruners only

B. Agree but charge a higher rate

C. Explain that the request violates standards

D. Remove only interior branches first

81. What is the correct treatment of codominant stems with included bark on a young tree?

A. Waiting until maturity to correct

B. Correcting early while cuts are small

C. Applying systemic fungicide to the union

D. Removing the entire tree as a precaution

82. Which objective covers lower branch removal for vertical clearance?

A. Cleaning to remove dead branches

B. Reducing to lower the overall height

C. Restoring after previous damage

D. Raising for vertical clearance

83. When is tool disinfection between cuts most important?

A. When pruning trees with contagious vascular diseases

B. When using only bypass hand pruners on small twigs

C. When removing dead wood from dormant trees

D. When performing routine cleaning pruning

84. Which of the following does NOT belong in a professional pruning specification?

A. The identified pruning objective

B. The percentage of live foliage to remove

C. The climber's personal stylistic preferences

D. The diameter range of cuts to be made

85. What is the correct use range for bypass loppers?

A. Branches under a quarter inch only

B. Branches over eight inches at the base

C. Branches of four to six inches in diameter

D. Branches up to approximately one and a half to two inches

86. Which objective covers removing a dead branch from a mature tree?

A. Raising for vertical clearance beneath

B. Cleaning to remove dead and weak branches

C. Reducing to lower the crown height

D. Restoring after storm damage

87. What is the single most important factor in wound closure?

A. Placement of the cut relative to the branch collar

B. The brand of cutting tool used

C. The weather conditions during pruning

D. The time of day when cuts are made

88. What does current research show about wound dressings?

A. They are required by current ANSI A300

B. They accelerate closure in all species

C. They provide minimal benefit and may slow healing

D. They eliminate all decay organism entry

89. When should oak pruning be performed in oak wilt regions?

A. Warm summer months for faster closure

B. Dormancy to reduce beetle transmission risk

C. Wet rainy days when beetles are inactive

D. Any time of year with sterilized tools

90. What is the first step in diagnosing an unhealthy tree?

A. Applying broad-spectrum fungicide as a precaution

B. Collecting a wood core sample for analysis

C. Recommending immediate removal

D. Identifying the species and understanding normal characteristics

91. How is a sign of tree disease best described?

A. The tree's general response such as wilting

B. A description recorded in the report

C. Direct evidence of the causal agent

D. A homeowner's observational complaint

92. How is a symptom best described?

A. The tree's response such as wilting or yellowing

B. Direct evidence of the causal agent itself

C. A laboratory confirmation of a pathogen

D. A visible fruiting body on the trunk

93. What is a primary pest?

A. A pest found only in remote forest sites

B. A pest capable of killing healthy vigorous trees

C. A pest reproducing only during drought

D. A pest feeding only on dead tissue

94. How is emerald ash borer classified?

A. A secondary pest attacking only stressed trees

B. A saprophyte limited to dead ash wood

C. A beneficial predator of native insects

D. A primary pest of healthy ash trees of all sizes

95. What best describes Integrated Pest Management?

A. A decision framework using monitoring, thresholds, and tactics

B. A prohibition on all pesticide use

C. A specific brand of organic product

D. A biological control method only

96. What plant family is affected by fire blight?

A. Pinaceae, the pine family

B. Fagaceae, the beech family

C. Rosaceae, the rose family

D. Sapindaceae, the soapberry family

97. How does oak wilt spread between adjacent oaks?

A. Wind dispersing spores across distances

B. Soil nematodes on fine roots

C. Rain splash from infected leaves

D. Root grafts and sap-feeding beetles at wounds

98. What deficiency produces interveinal chlorosis on new pin oak leaves in alkaline soil?

A. Nitrogen deficiency from lawn competition

B. Iron unavailability from high pH

C. Potassium toxicity suppressing magnesium

D. Calcium excess from past liming

99. Which pattern signals nitrogen deficiency?

A. Yellowing first on new leaves at shoot tips

B. Cupping and twisting of new growth

C. Uniform yellowing of older inner leaves first

D. Sudden wilting of the entire canopy

100. What most likely causes cupping and twisting of new growth on a mature tree?

A. Phenoxy herbicide drift exposure

B. Normal seasonal fall color change

C. Active spider mite feeding damage

D. Drought stress during summer

101. When does delayed construction decline typically appear?

A. Within hours of the damaging activity

B. Always on the first anniversary of damage

C. Only during the next major drought

D. Months to several years after the event

102. How is anthracnose best classified?

A. A systemic bacterial vascular infection

B. A fungal leaf disease producing spots and blotches

C. A viral disease transmitted by leafhoppers

D. A nutrient disorder limited to foliage

103. What field finding confirms Armillaria root rot?

A. White mycelial sheets beneath the bark

B. Orange pustules on leaf upper surfaces

C. Sticky honeydew on twig tips

D. Hollow insect tunnels in heartwood

104. How does Dutch elm disease spread primarily?

A. Wind carrying spores over long distances

B. Soil nematodes on elm fine roots

C. Elm bark beetles and root grafts

D. Rain splash from infected foliage

105. What is the most appropriate treatment for a high-value ash threatened by EAB?

A. Weekly foliar sprays through the season

B. Trunk injection of systemic insecticide

C. Soil drench with an herbicide product

D. No treatment because ash cannot be saved

106. What does "the label is the law" mean for pesticide use?

A. Labels are advisory guidelines only

B. Labels expire one year after opening

C. Labels apply only to first-time use

D. Labels are legally enforceable federal documents

107. What is the correct response when no treatment exists for a diagnosed disease?

A. Honest communication and appropriate management recommendations

B. Experimental treatments without owner consent

C. Immediate removal of all nearby trees

D. Refusal to discuss the findings with the owner

108. What CRZ radius corresponds to a 24-inch DBH tree?

A. 6 feet from the trunk outward

B. 12 feet from the trunk outward

C. 24 feet from the trunk outward

D. 48 feet from the trunk outward

109. Where should tree protection fencing be placed?

A. Directly against the trunk bark

B. Halfway between trunk and dripline

C. At the dripline regardless of species

D. At the CRZ boundary or further out

110. What is the main concern with concrete washout in a Tree Protection Zone?

A. Aggregate damaging fine absorbing roots

B. The high pH of the washwater sterilizing soil

C. Vibration disturbing root hairs

D. Cement setting around root surfaces

111. What happens when grade is raised 12 inches over a tree's root zone?

A. Immediate tree death within hours

B. Improved drainage across the zone

C. Gradual decline from root oxygen loss

D. Stronger anchorage during storms

112. Which utility installation method causes the least root damage?

A. Directional boring beneath the root zone

B. Open-cut trenching at full depth

C. Mechanical auger boring from above

D. Surface laying directly on the soil

113. Why is material storage prohibited within a Tree Protection Zone?

A. It violates aesthetic ordinances

B. It exceeds site insurance limits

C. It interferes with crew movement

D. It compacts soil and damages roots

114. When should pre-construction tree assessment occur?

A. After foundations are fully poured

B. Before final design influences decisions

C. After demolition has already begun

D. Only when trees show visible symptoms

115. What is correct field practice for unavoidable root cuts during excavation?

A. Making clean cuts with sharp tools at the damage line

B. Allowing random tearing by the excavator

C. Applying wound sealant to every cut surface

D. Waiting until excavation ends to assess

116. What is the correct post-construction care for a damaged tree?

A. Aggressive crown reduction to balance losses

B. Heavy nitrogen fertilization to force growth

C. Deep watering, mulching, and multi-year monitoring

D. Immediate trunk injection with fungicide

117. Why is the dripline inadequate as a protection boundary?

A. Drip lines are difficult to measure accurately

B. Actual roots extend well beyond the dripline

C. Drip lines cannot be legally enforced

D. Drip lines change shape seasonally

118. When does delayed decline typically appear after construction damage?

A. Within hours of the activity ending

B. Always on the exact first anniversary

C. Only during the first severe drought

D. Months to several years after the event

119. What is the correct specification for tree protection fencing?

A. Sturdy, visible, clearly marked, and maintained

B. Lightweight flagging that crews can move

C. Short stakes spaced widely apart

D. Painted to match nearby buildings

120. What is the single most effective construction protection action?

A. Wrapping the trunk in foam padding

B. Pre-construction heavy fertilization

C. Excluding all activity from the root zone

D. Reducing the crown to balance root loss

121. What happens when grade is lowered 6 inches around a mature tree?

A. Improved nutrient access in exposed layers

B. Direct loss of functional roots with the soil

C. Better wind anchorage in remaining roots

D. Improved drainage to deeper subsoil

122. What is the purpose of a baseline tree condition report?

A. Satisfying regulatory requirements automatically

B. Serving only as a client billing record

C. Eliminating future monitoring requirements

D. Documenting pre-existing conditions for later comparison

123. How long should post-construction monitoring continue?

A. Only during the active construction period

B. Only for the first thirty days

C. Three to five growing seasons or more

D. Only until the next major growing season

124. What is the purpose of hand or air excavation within a TPZ?

A. Identifying and preserving individual roots

B. Producing the fastest excavation speed

C. Eliminating arborist supervision needs

D. Lowering cost compared to mechanical methods

125. How should a tree contacting an energized line be treated?

A. Approached immediately for pruning

B. Sprayed with water to dissipate charge

C. Removed quickly before reporting

D. Treated as energized until utility confirms otherwise

126. What is the formal definition of risk in tree risk assessment?

A. The presence of any visible defect

B. The combination of likelihood of failure and consequences

C. The age of the tree multiplied by height

D. The total monetary value of the tree

127. How is a Level 1 tree risk assessment described?

A. A detailed single-tree inspection with probe

B. Laboratory analysis of wood core samples

C. A rapid limited visual screening of many trees

D. Advanced tomographic imaging in the field

128. What is a Level 2 tree risk assessment?

A. A detailed visual inspection of a single tree

B. A drive-by survey of hundreds of street trees

C. A laboratory analysis of collected cores

D. A model based only on the tree species

129. Which tools define a Level 3 risk assessment?

A. Only a mallet for sounding the trunk

B. Resistograph drilling and sonic tomography

C. Standard tape and ground observation

D. Drive-by photography from a vehicle

130. What is the correct interpretation of included bark between codominant stems?

A. A normal strong attachment pattern

B. A feature reducing splitting risk

C. A condition needing no attention

D. A structurally weak union

131. What does a fungal fruiting body on a trunk indicate?

A. Active decay established within the tree

B. A beneficial mycorrhizal partnership

C. Normal seasonal bark shedding

D. A symptom of nitrogen over-fertilization

132. What is a target in tree risk assessment?

A. A branch identified for removal

B. A zone where the tree will fall

C. Any person, property, or activity potentially affected

D. An area of externally visible decay

133. What does target occupancy rate measure?

A. The number of trees per acre

B. The frequency and duration of target presence in the strike zone

C. The age of nearby structures

D. The total property value

134. What does a new lean with fresh soil cracking on the opposite side indicate?

A. A cosmetic change of no structural meaning

B. Normal phototropic response to light

C. Seasonal soil movement unrelated to the tree

D. Root plate movement and uprooting risk

135. What is the purpose of sounding the trunk with a mallet?

A. Measuring the nitrogen content of wood

B. Identifying species from the sound

C. Detecting hollow areas through sound changes

D. Locating overwintering insects

136. What two dimensions define the TRAQ risk matrix?

A. Likelihood of failure and impact with consequences

B. Tree species and trunk diameter

C. Site drainage and soil pH

D. Property value and tree age

137. What does a "probable" likelihood of failure mean in TRAQ?

A. Failure is impossible under any conditions

B. Failure is unlikely but theoretically possible

C. Failure is already imminent or occurring

D. Failure is likely during the assessment period

138. What consequences qualify as "severe" in TRAQ?

A. Minor property damage easily repaired

B. Catastrophic damage, serious injury, or death

C. Moderate damage with no serious injury

D. No measurable effect on targets

139. When may a tree with an internal cavity still be structurally sound?

A. When sufficient intact wood remains around the perimeter

B. When the cavity drains water quickly

C. When the cavity is less than four inches across

D. When the cavity is above six feet from grade

140. On what factors do consequences of failure depend?

A. Only the total weight of the failing part

B. Only the distance to the nearest structure

C. The part size, fall height, and target nature

D. Only the calendar age of the tree

141. What is residual risk?

A. Insurance premium cost on the property

B. Risk during the mitigation work itself

C. Risk visible only after removal

D. Risk remaining after mitigation is implemented

142. Which item should NOT appear in a professional risk report?

A. The scope of the assessment performed

B. A removal recommendation for every tree

C. Identified defects and nearby targets

D. Recommended mitigation and residual risk

143. What do cabling and bracing systems achieve?

A. Reducing but not eliminating structural risk

B. Complete elimination of structural risk

C. Required installation under ANSI A300

D. No further inspection after installation

144. How should an arborist communicate risk findings to a property owner?

A. Using heavy technical jargon for credibility

B. Recommending only the most expensive option

C. Using plain language with respect for owner decisions

D. Withholding uncertain information

145. Why are root defects difficult to evaluate?

A. Roots always heal spontaneously

B. Roots are below ground and not directly observable

C. Roots produce no above-ground symptoms

D. Roots are only present in young trees

146. What does a healthy rounded callus around an old wound represent?

A. A major structural defect requiring removal

B. An active cavity needing cabling

C. A sign of hidden decay beneath bark

D. Successful compartmentalization, not a defect

147. What is the appropriate mitigation for a moderate-risk overextended branch?

A. Reduction pruning to decrease end weight

B. Removing the entire tree as a precaution

C. Ignoring until the branch actually fails

D. Cabling every branch in the crown

148. Which is the principal safety standard for arboricultural operations?

A. ANSI A300 for tree pruning

B. ANSI Z60.1 for nursery stock

C. ANSI Z133 for arboricultural safety

D. OSHA 29 CFR 1926 for general construction

149. What is the minimum approach distance for an unqualified worker to energized lines below 50 kV?

A. Three feet from the conductor

B. Ten feet from the conductor

C. Five feet from the conductor

D. Twenty-five feet from the conductor

150. What distinguishes a qualified line-clearance arborist?

A. Only a current bucket truck license

B. Only personal insulated gloves

C. Only general landscape experience

D. Specialized training in electrical hazards and line work

151. What feature must a climbing helmet include beyond a hard hat?

A. A wide brim for sun protection

B. Reflective tape on all surfaces

C. A chin strap to retain during climbing

D. An open face design for vision

152. How does chainsaw-resistant leg protection work?

A. Containing fibers that clog the chain on contact

B. Activating an electromagnetic brake on the saw

C. Reflecting the chain away from the skin

D. Producing an audible warning to the operator

153. At what noise level does OSHA require hearing protection?

A. 30 decibels of normal conversation

B. 85 decibels of chainsaw operation

C. 50 decibels of quiet outdoor activity

D. 120 decibels of extreme machinery

154. What should a pre-work job briefing cover?

A. Only the names of crew members

B. Only the lunch break schedule

C. Only the pricing of the work

D. Work scope, hazards, PPE, and emergency procedures

155. When does ANSI Z133 require aerial rescue capability?

A. For essentially all crew climbing operations

B. Only for trees over 100 feet tall

C. Only when electrical hazards are present

D. Only on weekends with delayed EMS

156. What causes suspension trauma in a motionless climber?

A. Rope deterioration from body heat

B. Harness buckle corrosion from sweat

C. Blood pooling in the legs reducing venous return

D. Helmet restriction of head blood flow

157. Where is the kickback zone of a chainsaw?

A. The rear handle near the throttle

B. The middle of the bar during cutting

C. The bottom edge near the powerhead

D. The upper portion of the bar tip

158. What is the function of the chain brake?

A. Slowing the chain to idle when not cutting

B. Stopping the chain on kickback or manual activation

C. Reducing vibration transmitted to hands

D. Preventing engine flooding on cold starts

159. What is the correct left-hand chainsaw grip?

A. Only fingertip contact for quick release

B. Loose palm contact to absorb vibration

C. Thumb wrapped fully around the front handle

D. Thumb tucked alongside the handle

160. What is the standard operating practice for nearly all chainsaw use?

A. Two-handed operation with proper grip

B. Optional one-handed use by preference

C. Required for only the largest trees

D. Reserved only for overhead cuts

161. What is the purpose of a top-handle chainsaw?

A. Cutting residential firewood at ground level

B. Climbing arborist use up in the canopy

C. Bucking large logs from a standing position

D. Felling full-sized forest trees

162. What does the chain catcher on a chainsaw do?

A. Sharpens the chain automatically during use

B. Lubricates the chain during extended cuts

C. Secures the chain during transport

D. Catches the chain if it breaks or derails

163. How is working load limit typically calculated?

A. Approximately one-tenth of tensile strength

B. Approximately half of tensile strength

C. Approximately nine-tenths of tensile strength

D. Equal to the full tensile strength

164. What is shock loading in rigging?

A. The static weight of the largest piece

B. The initial lifting force on a cut piece

C. Dynamic force from a falling piece suddenly caught

D. Electrical charge buildup in a dry rope

165. What is the best way to reduce shock loading during a catch?

A. Tying the line to a hard anchor

B. Using the smallest rope that fits

C. Positioning a worker beneath the piece

D. Using a friction device for controlled slip

166. What force does a rigging block redirecting a load experience?

A. Exactly half the load force

B. Approximately twice the load force

C. Precisely the load force alone

D. No additional force when installed correctly

167. What is the purpose of the hinge in a felling cut?

A. Controlling fall direction as the tree commits

B. Being cut completely through before the fall

C. Substituting for the notch cut

D. Providing a decorative stump remnant

168. When should a felling escape route be planned?

A. Directly beneath the falling tree

B. Exactly straight behind the feller

C. Before cutting begins each time

D. At the moment of the actual fall

169. What does "barber chair" refer to in felling?

A. A resting position between cuts

B. Vertical trunk splitting during the back cut

C. A specialty softwood chain

D. A decorative form left in the stump

170. How should chipper operators feed branches?

A. Tip first from directly behind

B. Wearing loose clothing for release

C. Only during evening hours

D. Butt end first from the side

171. How must aerial lift approach distance be maintained near energized lines?

A. With both the bucket and the boom

B. Only at the bucket outermost reach

C. Only by the rubber tires below

D. Only at the hydraulic cylinders

172. How often should PPE be inspected?

A. Only during annual safety reviews

B. Only after a known failure event

C. Before every use, with damaged items retired

D. Only by the original manufacturer

173. What is the ANSI Z133 minimum climbing rope tensile strength?

A. 1,800 pounds for residential work

B. 3,000 pounds for routine maintenance

C. 10,000 pounds for any climbing

D. 5,400 pounds per the current standard

174. How should a properly tied friction hitch behave?

A. Locking rigidly without movement

B. Gripping reliably while allowing controlled adjustment

C. Slipping continuously for rapid descent

D. Being replaced after every climb

175. What is the function of a chipper's feed control bar?

A. Indicating chipping drum speed

B. Metering lubricant to the rollers

C. Stopping the feed rollers in an emergency

D. Switching between forward and reverse

176. What is the correct procedure before refueling a chainsaw?

A. Stopping the saw and letting it cool briefly

B. Refueling quickly without removing the cap

C. Keeping the saw at low idle during refueling

D. Refueling with cut-resistant gloves on

177. What is the correct status of a worksite first aid kit?

A. Stored off site in a parked vehicle

B. Carried by only the safety officer

C. Limited to over-the-counter items

D. Available on site and stocked appropriately

178. How do urban trees reduce the heat island effect?

A. Releasing methane into the atmosphere

B. Shading surfaces and providing evapotranspiration cooling

C. Absorbing heat through root systems

D. Reflecting sunlight from leaf surfaces

179. What does a complete tree inventory record?

A. Every tree within the defined area

B. Only trees scheduled for removal

C. Only a statistical sample of the population

D. Only trees with visible defects

180. What is the purpose of the i-Tree suite of tools?

A. A plant taxonomy identification textbook

B. A nursery stock pricing catalog

C. Estimating dollar value of ecosystem services

D. Determining genetic makeup of urban forests

181. When is the trunk formula method of appraisal used?

A. When the tree has no visible defects

B. When the tree is too large to replace with nursery stock

C. For recently planted nursery specimens

D. When a replacement of identical size exists

182. What does a typical tree protection ordinance require?

A. A ban on all pruning by owners

B. Mandatory removal of mature trees

C. Application only to city-planted trees

D. Permits for removal of protected trees

183. How are canopy cover goals typically expressed?

A. As total leaf biomass annually

B. As number of trees per square mile

C. As percentage of land area covered

D. As average street tree height in feet

184. What is the Tree City USA minimum community forestry budget?

A. Two dollars per capita annually

B. Ten dollars per capita annually

C. Fifty dollars per capita annually

D. One hundred dollars per capita annually

185. What does species rating in appraisal reflect?

A. The lumber market value of the wood

B. The calendar age of the tree

C. The current height in feet

D. The desirability and suitability in the local area

186. What is the correct approach to communicating with property owners?

A. Technical jargon to display expertise

B. Plain language with respect for owner decisions

C. Pressure tactics to close sales quickly

D. Refusal to provide pricing estimates

187. What documented benefit of urban trees is supported by multiple studies?

A. Improved mental health and reduced stress

B. Increased crime rates in wooded areas

C. Higher asthma rates in all age groups

D. Reduced physical activity among residents

188. What is the most persuasive argument for canopy expansion to a budget-focused council?

A. Forestry staff aesthetic preferences

B. The mayor's favorite tree species

C. Documented dollar value of ecosystem services

D. Simplicity of installing artificial turf

189. What is the primary benefit of the 10-20-30 diversity rule?

A. Reducing nursery stock costs

B. Protecting against catastrophic pest loss

C. Ensuring uniform tree growth rates

D. Limiting total city tree numbers

190. Which is the principal U.S. standard for tree pruning?

A. ANSI Z133 for safety operations

B. ANSI Z60.1 for nursery stock

C. OSHA 29 CFR 1926 for construction

D. ANSI A300 for tree pruning practices

191. Which of the following is NOT one of the five ANSI A300 primary pruning objectives?

A. Topping for mature size control

B. Cleaning of dead and weak wood

C. Raising for vertical clearance

D. Reducing for crown height control

192. What is the purpose of tree risk assessment reports?

A. Establishing property insurance premiums

B. Determining the exact market value of trees

C. Communicating findings, options, and residual risks

D. Guaranteeing that trees will never fail

193. What does the ISA Certified Arborist credential primarily indicate?

A. Unlimited authority to remove any tree

B. A license to practice in all U.S. states

C. Complete expertise in every arboricultural area

D. Competency in the fundamentals of arboriculture

194. What is the main role of professional ethics in arboriculture?

A. Setting minimum hourly billing rates

B. Guiding conduct in client and industry relationships

C. Establishing pesticide application licensing

D. Defining ANSI A300 pruning requirements

195. How should an arborist handle a request for work that violates accepted standards?

A. Decline and explain the professional concern

B. Comply if the client insists in writing

C. Perform the work at a higher fee

D. Refer the request to a different company

196. What best describes an arborist's role in public safety?

A. Guaranteeing no tree will ever fail

B. Eliminating every defect on every tree

C. Identifying, communicating, and mitigating risks

D. Removing all mature trees near targets

197. What is the primary purpose of continuing education for certified arborists?

A. Meeting nursery association requirements

B. Maintaining current knowledge and credential status

C. Complying with insurance company rules

D. Satisfying property owner expectations

198. When is tree removal the correct recommendation?

A. When any visible defect is present

B. When the tree is older than fifty years

C. When property owners request removal

D. When risks cannot be acceptably mitigated

199. How should an arborist handle uncertainty in a diagnosis?

A. Communicate the uncertainty honestly to the client

B. Provide a single definitive diagnosis regardless

C. Withhold the finding to avoid client concern

D. Recommend removal as a precaution

200. What is the foundational principle of all tree care work?

A. Maximizing company profit on every job

B. Applying the largest recommended treatments

C. Providing the tree's best long-term welfare

D. Completing work in the shortest possible time

PRACTICE EXAM 20 — ANSWER KEY AND EXPLANATIONS

1. D — The vascular cambium divides inward to produce new xylem and outward to produce new phloem, thickening the trunk each year. Heartwood, bark, and pith do not produce new wood. The cambium is the engine of secondary growth.

2. B — Phloem is living inner-bark tissue that transports sugars from sources (typically leaves) to sinks (roots, growing tips, storage tissues). Unlike xylem, phloem must remain living because sugar transport requires active cellular processes. This is the fundamental difference between the two vascular tissues.

3. A — Transpiration at leaf surfaces generates tension that pulls water upward through xylem in continuous columns held together by hydrogen bonding. No active metabolic pumping is required from the tree. This is the cohesion-tension mechanism of water transport.

4. C — When stomata close, CO_2 can no longer enter the leaf, so photosynthesis decreases along with transpiration. This trade-off between water conservation and carbon gain is the central constraint on tree function under drought stress. Both processes are linked through stomatal aperture.

5. B — Wall 4 is formed by the cambium at the wound margin and is the strongest of the four CODIT walls. It resists outward spread of decay into new wood produced after the injury. Preserving the branch collar during pruning is essential because it contains this critical cambium.

6. D — Mycorrhizal fungi colonize tree roots and extend hyphae outward into the surrounding soil, dramatically increasing the effective absorbing surface area. The tree supplies sugars; the fungus supplies water and nutrients from a much larger soil volume. The partnership is essential for most tree species.

7. A — Reserves reach their lowest point in late spring after new leaves have emerged but have not yet returned more sugar than the refoliation cost. Spring defoliation during this window is particularly devastating. Reserves rebuild through summer photosynthesis.

8. C — Girdling roots compress vascular tissue — phloem and cambium — at the trunk, restricting downward sugar transport and eventually water movement. As the trunk thickens, the compression worsens over years. This explains why girdling root decline can take a decade or more to become visible.

9. D — Most absorbing roots are found in the upper 12 to 18 inches of soil where oxygen, water, and nutrients are most available. They often extend two to three times the crown radius. The deep taproot image is largely inaccurate for mature trees.

10. B — Heartwood is composed of dead cells with extractives (tannins, resins) deposited in the cell walls, providing decay resistance and structural support. Sapwood, by contrast, is the outer functional xylem. This distinction explains heartwood's durability.

11. A — Auxin is produced at the shoot tip and moves downward, suppressing lateral bud growth and maintaining apical dominance. Removing the leader interrupts auxin flow and releases lateral buds to grow. This hormonal mechanism is the biological basis for many pruning responses.

12. C — The branch collar is swollen stem tissue at the branch base that contains the cambium forming Wall 4. Preserving the collar during pruning is essential for proper compartmentalization. Flush cuts damage the collar; stubs leave wood beyond it.

13. B — Sunscald results from rapid temperature changes on sunny winter days, when bark warms from direct sun and then suddenly cools. Tissues under the warm bark become active and are damaged when temperatures drop. Young or thin-barked trees on the south or southwest side are most susceptible.

14. D — Reaction wood is produced in response to mechanical stress such as wind flexing or lean. Conifers produce compression wood on the lower side; hardwoods produce tension wood on the upper side. Both responses help adapt the tree to mechanical forces.

15. A — Xylem conducting cells are dead at functional maturity, forming hollow tubes that transport water through the cohesion-tension mechanism. This design requires no metabolic energy. Phloem, in contrast, must remain living because sugar transport is an active process.

16. C — Stomata are microscopic pores on leaf surfaces that regulate gas exchange between the leaf and the atmosphere — allowing CO_2 in and water vapor and oxygen out. Stomata can open and close in response to environmental conditions. They are not structural or reproductive organs.

17. D — Reserves are already at their lowest point in spring after refoliation. Spring defoliation forces the tree to refoliate a second time with already depleted reserves. This is why spring defoliators are particularly damaging.

18. B — The branch bark ridge is a raised line of bark on the upper surface of a branch union, running outward along the stem from the crotch. It marks the dividing line between stem and branch tissue and is the reference point for correct cut placement.

19. A — A latent bud is a dormant bud that remains in reserve under the bark until triggered to grow by injury, severe pruning, or other stress. Latent buds are the source of epicormic sprouts following topping or canopy damage.

20. C — Epicormic sprouts emerge from latent or adventitious buds after stress events such as topping, severe defoliation, or canopy damage. They are weakly attached and produce the poor structure seen after topping. Normal scaffold branches form from active buds.

21. B — Respiration is a continuous process in every living cell that consumes stored sugars to release energy for cellular function. It occurs day and night throughout the year, not just during active growth. Respiration is fundamentally different from photosynthesis.

22. D — Primary growth extends shoots and roots in length at apical meristems. Secondary growth thickens trunks and branches through cambial activity. Together, the two types of growth produce the overall tree form.

23. C — MAD Horse stands for Maples, Ashes, Dogwoods, and Horse chestnut — the common temperate genera with opposite leaf arrangement. Most other broadleaf trees are alternate. This mnemonic eliminates most identification possibilities at a glance.

24. A — White oaks have rounded leaf lobes without bristles and acorns that mature in a single growing season. Red oaks have pointed bristle-tipped lobes and acorns maturing over two seasons. These differences are the primary field distinction.

25. B — Red oaks have pointed leaf lobes ending in bristles and produce acorns that mature over two growing seasons. White oaks have rounded lobes without bristles and one-season acorns. Lobe shape is the first identification clue.

26. D — Bald cypress (*Taxodium distichum*) is a deciduous conifer that sheds its needles each autumn. It is one of a small group of deciduous conifers including larch and dawn redwood. Pine, hemlock, and red cedar are all evergreen.

27. A — Binomial nomenclature requires the genus capitalized and italicized in print, with the specific epithet lowercase and also italicized. *Acer rubrum* follows the convention correctly. All-caps and all-lowercase forms violate the rules.

28. C — A name in single quotation marks following a species name indicates a cultivar — a cultivated variety propagated clonally. Cultivar names are not italicized. They differ from botanical varieties found in wild populations.

29. B — The 10-20-30 rule limits urban forests to no more than 10% of any single species, 20% of any single genus, and 30% of any single family. The hierarchy protects against threats at each taxonomic level. Dutch elm disease and emerald ash borer illustrate why diversity matters.

30. D — Horse chestnut (*Aesculus hippocastanum*) has palmately compound leaves with five leaflets, opposite arrangement, and showy upright spring flower spikes. It belongs to the soapberry family along with maples. It is the "Horse" in the MAD Horse mnemonic.

31. C — American sycamore (*Platanus occidentalis*) is distinguished by mottled tan and white peeling bark. The bark alone often allows identification from a distance. It is one of the most visually distinctive native trees.

32. A — *Fraxinus* (the ash genus) belongs to the olive family Oleaceae, which also includes lilacs and forsythias. Family-level recognition matters for understanding pest susceptibilities. It is not in the pine, rose, or soapberry families.

33. D — A flowering crabapple reaching 15 to 20 feet is appropriate beneath a 25-foot distribution line, leaving safe clearance. This is a direct application of Right Tree, Right Place. The larger species would inevitably conflict with the conductors.

34. B — Tree of heaven (*Ailanthus altissima*) is widely classified as a non-native invasive species in much of eastern North America. It escapes cultivation and colonizes disturbed sites aggressively. It is also the preferred host of the spotted lanternfly.

35. A — Right Tree, Right Place primarily means matching a tree's mature characteristics — size, form, soil and water needs, tolerance — to the conditions of the planting site. Ignoring mature dimensions is the most common species selection error.

36. C — A pinnately compound leaf has leaflets arranged along two sides of a central rachis, like the feathers of a bird. Palmately compound leaves have leaflets clustered at a single point. Ash, hickory, and walnut are pinnate.

37. B — MAD Horse stands for Maples, Ashes, Dogwoods, and Horse chestnut — the common temperate genera with opposite leaf arrangement. This mnemonic is the first step in narrowing identification. Most other broadleaf trees are alternate.

38. D — Winter identification of deciduous trees relies on bud shape, twig features, and bark character because leaves are absent. These features are reliable enough for confident identification. Experienced arborists can identify most deciduous trees from twigs alone.

39. A — Loam is a soil texture with roughly balanced proportions of sand, silt, and clay. It drains adequately, holds enough water, and supports good structure when organic matter is present. Loam is the ideal texture for most tree species.

40. C — A pH of 7.0 is the neutral midpoint of the pH scale, neither acidic nor alkaline. Values below 7.0 are acidic; values above are alkaline. Each whole number represents a tenfold change in hydrogen ion concentration.

41. D — Cation exchange capacity is a measure of the soil's ability to hold and exchange cation nutrients such as calcium, magnesium, and potassium. It primarily depends on clay content and organic matter. Higher CEC means better nutrient retention.

42. B — A bulk density of 1.8 g/cm³ indicates severe compaction that halts most root growth. Values above 1.7 progressively limit root penetration. Values below 1.3 generally indicate good structure.

43. A — An ideal soil contains approximately 50% pore space by volume, split roughly between water and air, with the remaining 50% as mineral solids and small organic fraction. Pore space is where roots, water, and air reside.

44. C — A composite sample averages variation across the area being tested, producing a representative result. Multiple subsamples are combined before analysis. Proper sampling is the most important step in soil testing.

45. D — A 36-hour drain time indicates inadequate drainage for most tree species. Drainage longer than 12 to 24 hours signals a drainage problem. Site modification or drainage-tolerant species selection is required.

46. B — Iron chlorosis in pin oak growing in alkaline soil is almost always caused by high pH rendering iron chemically unavailable. The iron is present but not in forms roots can absorb. Treatment must address pH or use chelated iron.

47. C — A proper mulch ring is 2 to 4 inches deep with the trunk kept clear. Deeper layers suffocate roots, and piling mulch against the trunk causes bark decay. The correct shape is a flat ring, not a volcano.

48. A — Compaction reduces pore space and the large pores that hold air, starving roots of oxygen needed for respiration. Roots that cannot respire cannot absorb water or nutrients. This is the primary mechanism by which compaction kills urban trees.

49. D — Soil texture is essentially permanent because the proportions of sand, silt, and clay cannot be meaningfully altered by any realistic amount of amendment. Working with existing texture is the only realistic strategy. Structure, unlike texture, can be improved.

50. B — Agricultural lime raises soil pH by neutralizing acidity through the addition of calcium carbonate. It is the standard amendment for correcting acidic soils. Sulfur has the opposite effect.

51. A — The root flare should sit at or slightly above the surrounding grade at planting. Burying the flare is one of the most common serious planting errors. The correct depth preserves the flare and allows for some settling without burial.

52. C — Current best practice is to backfill with the unamended native soil excavated from the planting hole. Research has shown that heavily amended backfill can produce pot-bound conditions in the ground. Soil improvement is better delivered through surface mulching.

53. B — Planting holes should be at least two to three times the diameter of the root ball to provide a zone of loosened soil for new roots to expand into. Width matters more than depth. A hole dug just to ball width offers no expansion zone.

54. D — A widely used rule of thumb is one year of establishment per inch of trunk caliper at planting. A 3-inch caliper tree needs about three growing seasons. During this period the tree is rebuilding its root system.

55. A — Staking should be used only when necessary and removed within one growing season in most cases. Unnecessary or prolonged staking produces weaker trunks. The natural flex of the trunk builds strength and taper.

56. C — Circling roots found at planting should be cut or straightened before the tree is placed in the hole. Leaving them in place guarantees they will remain as permanent defects. Correction becomes impossible once backfilled.

57. D — Current best practice is to cut and remove at least the upper portion of the wire basket after the tree is set in the hole, along with burlap and twine contacting the trunk. Full removal risks damaging the ball; the lower portion can be left in place.

58. B — A balled-and-burlapped tree must be lifted by supporting the root ball from underneath, never by the trunk. Lifting by the trunk can separate the trunk from the ball and destroy the root connection. This is one of the most basic handling rules.

59. C — Establishment watering should keep the root ball and surrounding backfill consistently moist but not saturated. Both extremes are damaging — dry kills through desiccation and saturation kills through suffocation. Checking soil moisture directly is more reliable than fixed schedules.

60. A — Fertilization of a newly planted tree during its first growing season is generally unnecessary and can be counterproductive. A reduced root system cannot effectively use additional nitrogen, and forced top growth exceeds what the roots can support.

61. D — Dormancy — late fall after leaf drop or early spring before bud break — is the preferred transplanting window for most deciduous trees. The tree is not actively transpiring and the stress of root loss is minimized. Summer transplanting carries much higher risk.

62. B — Advance root pruning severs roots at the future root ball line one or more growing seasons before the move. The tree responds by producing new fibrous roots inside the line, which are harvested with the ball and dramatically improve transplant survival.

63. A — Twine tied around the trunk does not decompose reliably and can girdle the trunk as it grows. Synthetic twine in particular persists indefinitely. A single cut at planting prevents years of later damage.

64. C — A proper pruning cut is placed just outside the branch collar and bark ridge so the cambium at the wound edge can form Wall 4. Flush cuts and stubs both damage this mechanism. Correct placement is the biological foundation of good pruning.

65. B — Topping creates large wounds that cannot close, removes excessive foliage, depletes carbohydrate reserves, and produces weakly attached epicormic sprouts. It violates every principle of proper pruning simultaneously. ANSI A300 explicitly prohibits it.

66. D — The three-cut method prevents bark from tearing down the trunk below the cut when a heavy branch falls. A single cut from above causes the falling weight to rip bark downward. The undercut severs this bark pathway in advance.

67. A — Cleaning is the selective removal of dead, dying, diseased, broken, and weakly attached branches from the crown. It is one of the five primary pruning objectives recognized by ANSI A300 and the most common routine objective.

68. C — A reduction cut removes a branch back to a lateral large enough (typically at least one-third the diameter of the removed portion) to assume the terminal role. Heading cuts, by contrast, leave arbitrary stubs without regard to laterals.

69. D — Structural pruning during the juvenile phase produces the greatest benefit because small cuts now correct defects that would otherwise require much larger, more damaging cuts decades later. The architectural framework is still being established.

70. B — Removing no more than 10 to 15% of live foliage in a single session is the general limit for mature trees, with even less for older or stressed specimens. Heavy pruning depletes reserves and produces weakly attached epicormic sprouts.

71. C — The branch bark ridge is a raised line of bark on the upper surface of a branch union, running outward along the stem from the crotch. It marks the dividing line between stem and branch tissue and is the reference for correct cut placement.

72. A — Lion-tailing strips interior foliage and concentrates weight at the branch ends, creating weaker branches than properly distributed thinning. The pattern removes interior foliage that cushions wind loads. It is explicitly discouraged under current standards.

73. D — Pollarding is a long-term system requiring repeated cuts at the same framework points on an ongoing schedule, usually annually or biennially. It must be maintained once begun. Abandoning a pollarded tree produces weakly attached epicormic growth.

74. B — Restoration pruning develops an acceptable crown structure from sprouts that have emerged after topping, vandalism, or severe storm damage. It is a long-term process requiring multiple visits over years. It cannot undo the original damage.

75. A — Subordination reduces the growth of a competing stem in favor of a dominant leader, gradually shifting dominance without the wound of outright removal. It is used to correct codominant stems in young trees.

76. C — A flush cut removes the branch collar along with the branch, eliminating the cambium that would have formed Wall 4. The result is a wound that cannot be effectively compartmentalized and provides a direct pathway for decay.

77. B — A stub cut leaves dead wood projecting beyond the branch collar that the tree cannot compartmentalize. The dead stub becomes an entry point for fungal colonization that eventually reaches the collar and then the trunk.

78. D — Bypass hand pruners cut cleanly without crushing living wood and are the correct choice for branches up to about one inch in diameter. Anvil blades tend to crush living tissue. Matching tool to branch size is basic professional practice.

79. A — A pole pruner is most appropriate for small-diameter branches out of reach from the ground that do not warrant climbing. Larger branches require more controlled methods. Pole pruners extend reach without requiring positioning.

80. C — Removing 50% of live foliage from a mature tree far exceeds the 10 to 15% guideline and would initiate decline. The professional response is to explain that the request violates accepted standards and propose an appropriate alternative.

81. B — Codominant stems with included bark should be corrected early, while the tree is young and the cuts are small. Subordination or removal shifts dominance to a single leader. Waiting until maturity requires much larger and more damaging cuts.

82. D — The raise objective refers to selective removal of lower branches to provide vertical clearance beneath the crown. It is one of the five primary pruning objectives in ANSI A300. Raising should be done gradually on young trees.

83. A — Tool disinfection is most important when pruning trees with known contagious diseases such as fire blight. Disease organisms can be transferred between cuts on contaminated blades. For routine work on healthy trees, disinfection is not generally required.

84. C — A professional pruning specification should include the identified objective, the percentage of foliage to be removed, and the diameter range of cuts. The climber's personal preferences are not part of a professional specification — clear specifications protect tree, client, and arborist.

85. D — Bypass loppers extend the principle of hand pruners to branches up to approximately one and a half to two inches in diameter, using long handles for mechanical advantage. Smaller branches are better handled by hand pruners.

86. B — Removing a dead branch is part of the cleaning pruning objective, which is defined as selective removal of dead, dying, diseased, broken, and weakly attached branches. Cleaning is the most common routine pruning objective.

87. A — The placement of the cut relative to the branch collar is the single most important factor in whether a pruning wound closes successfully. Correct placement preserves the cambium that forms Wall 4; incorrect placement eliminates it.

88. C — Research has shown that wound dressings provide minimal benefit and in some cases actually slow compartmentalization by trapping moisture and creating favorable conditions for decay organisms. Current best practice is to leave pruning cuts unsealed.

89. B — In oak wilt regions, pruning of oaks should be postponed until dormancy to reduce the risk of attracting sap-feeding beetle vectors to fresh wounds. Timing is the primary defense. Dormant-season pruning minimizes transmission risk.

90. D — Diagnosis begins with identifying the species and understanding its normal characteristics, because a symptom cannot be evaluated without knowing what a healthy specimen looks like. Jumping to treatment leads to routine misdiagnosis.

91. C — A sign is direct evidence of the causal agent itself — fungal fruiting bodies, visible insects, or confirmed pathogens. Signs are more reliable than symptoms because they point directly to a cause rather than to the tree's response.

92. A — Symptoms are the tree's response to a problem — wilting, yellowing, dieback, thinning. Symptoms indicate that something is wrong but usually do not identify the specific cause. Multiple problems can produce overlapping symptoms.

93. B — A primary pest can attack and kill healthy, vigorous trees on its own without requiring the host to be stressed first. Secondary pests attack only weakened trees. The distinction is critical for management decisions.

94. D — Emerald ash borer is classified as a primary pest because it can successfully attack and kill healthy ash trees of all sizes. This distinguishes it from most native wood borers and is why it has devastated ash populations across North America.

95. A — IPM is a decision-making framework that integrates monitoring, action thresholds, multiple control tactics, and outcome evaluation. It is not a specific product or a prohibition on pesticides. The least toxic effective option is preferred.

96. C — Fire blight is caused by the bacterium *Erwinia amylovora* and affects members of the rose family (Rosaceae), including apple, pear, hawthorn, and serviceberry. Family-level recognition matters because susceptibility extends across the family.

97. D — Oak wilt spreads through root grafts between adjacent oaks and through sap-feeding beetles attracted to fresh wounds. The beetle-vector pathway makes warm-season pruning of oaks particularly risky in affected regions.

98. B — Iron is an immobile nutrient, and deficiency appears first on new leaves as interveinal chlorosis with green veins. In alkaline soil, iron is chemically unavailable despite being present. Treatment must address pH or use chelated iron.

99. C — Nitrogen is a mobile macronutrient that the tree translocates from older leaves to support new growth when supply is inadequate. Deficiencies therefore appear first on older inner leaves as uniform yellowing. All mobile-nutrient deficiencies follow this pattern.

100. A — Cupping and twisting of new growth on a mature tree most likely indicates phenoxy herbicide exposure such as 2,4-D, which mimics plant growth hormones. The pattern is often most severe on the side nearest the application source.

101. D — Delayed decline several years after construction almost always reflects root damage that occurred during the work. Trees mobilize reserves to mask initial injury, and visible symptoms typically appear one to three years later when reserves are exhausted.

102. B — Anthracnose is a general term for several fungal leaf diseases that produce spots, blotches, and leaf distortion, often followed by premature leaf drop. Most anthracnose infections are cosmetic rather than life-threatening.

103. A — Armillaria root rot produces characteristic white mycelial sheets (fungal tissue) beneath the bark of infected roots, visible when the bark is peeled back. Honey-colored mushrooms may also appear at the base in fall.

104. C — Dutch elm disease is a vascular wilt spread primarily by elm bark beetles carrying fungal spores and by root grafts between adjacent elms. This dual pathway is why the disease caused the near-total loss of American elm as a street tree.

105. B — Trunk injection of systemic insecticides is most appropriate for high-value trees threatened by borers, where foliar sprays would be impractical or ineffective for reaching internal tissues. Injection provides rapid systemic translocation with low environmental exposure.

106. D — "The label is the law" means pesticide product labels are legally enforceable federal documents. Applications must match the uses, rates, sites, and methods authorized on the label, and deviations carry legal and liability consequences.

107. A — When no effective treatment exists, the professional response is to communicate the diagnosis honestly and recommend appropriate management, which may include monitoring, removal, or supportive care. Honesty is part of professional standing.

108. C — The CRZ is commonly calculated as a radius of one foot per inch of trunk diameter at breast height. A 24-inch DBH tree has a 24-foot radius CRZ. This formula is the standard reference in ISA Best Management Practices.

109. D — Tree protection fencing should be placed at the calculated CRZ boundary or further from the trunk. Placing fencing at the dripline or closer leaves significant root area exposed. The CRZ formula produces a more defensible boundary.

110. B — The high pH of cement washwater can sterilize soil and kill roots in the affected area. Concrete washout within a TPZ is among the most damaging activities on construction sites and must be explicitly prohibited.

111. C — Raising the grade buries existing roots and root flares under added soil, producing gradual decline as buried tissues lose access to oxygen and gradually fail. Symptoms develop over months or years as reserves are exhausted.

112. A — Directional boring passes a utility beneath the root zone without disturbing the soil at root depth. Conventional open-cut trenching through the CRZ is the most damaging option. Higher equipment cost typically favors boring when tree value is significant.

113. D — Storage of construction materials within a TPZ is prohibited because stockpiles compact the underlying soil under their weight and smother roots. This is one of the standard prohibitions enforced by TPZ fencing.

114. B — Pre-construction tree assessment should occur before final design so findings can influence project decisions. Assessment after drawings are complete is reduced to documentation of what has already been decided.

115. A — Clean cuts with sharp tools at the damage line produce better wound responses than the tearing and crushing of unprepared excavation. The cambium can compartmentalize a clean cut more effectively. This should be done before excavation begins.

116. C — Post-construction care includes deep periodic watering, generous mulching, conservative pruning focused on deadwood and safety, and annual monitoring for at least three to five growing seasons. Patience drives recovery.

117. B — The actual root system of a mature tree typically extends two to three times the crown radius, well beyond the dripline. Using the dripline as the protection boundary leaves most absorbing roots exposed to damage.

118. D — Delayed decline following construction damage typically becomes visible months to several years after the triggering event. Trees mobilize reserves to mask initial injury, and when reserves are exhausted, decline begins. Monitoring should continue for at least three to five growing seasons.

119. A — Tree protection fencing should be sturdy, visible (brightly colored, at least four feet tall), clearly marked with signage, and maintained throughout construction. Flimsy flagging is routinely moved or ignored.

120. C — Excluding all activity — traffic, equipment, and materials — from the root zone is the single most effective action during construction. Compaction and root damage are prevented most reliably by keeping activity out entirely.

121. B — Lowering the grade removes soil along with any roots growing in it, producing immediate direct loss of functional root tissue. Even a few inches of grade cut can remove a large share of absorbing roots concentrated near the surface.

122. D — A baseline condition report documents pre-existing tree conditions for later comparison. It protects all parties when damage is alleged after construction, allowing actual damage to be distinguished from pre-existing conditions.

123. C — Post-construction monitoring should continue for three to five growing seasons because delayed decline can appear one to three years later as reserves are exhausted. Early apparent survival is not the same as long-term recovery.

124. A — Hand or air excavation allows workers to identify and preserve roots individually rather than severing them blindly. These techniques trade labor cost for root preservation and are appropriate when roots must be crossed.

125. D — A tree that has contacted an energized line should be treated as potentially energized until the utility confirms de-energization. A branch in contact with a line can energize the entire tree. Approaching without confirmation is a serious safety risk.

126. B — Risk is formally defined as the combination of likelihood of failure and severity of consequences. Neither tree condition nor target presence alone constitutes risk. Both factors must be considered together.

127. C — Level 1 assessment is a rapid limited visual screening used for large tree populations along streets, through parks, or across properties. Its purpose is to identify obvious hazards requiring further evaluation among many trees.

128. A — A Level 2 assessment is a detailed visual inspection of an individual tree, typically performed while walking around it from multiple angles using basic tools such as a mallet and probe. It is the standard level for trees of concern.

129. B — Level 3 assessment techniques include resistograph drilling, sonic tomography, static load testing, and other advanced instrumentation. These tools are reserved for high-value trees or situations where Level 2 has left significant uncertainty.

130. D — Included bark between codominant stems prevents the formation of a strong structural union. The attachment becomes progressively weaker as the stems grow, and catastrophic splitting can occur without warning.

131. A — The presence of a fungal fruiting body on a trunk indicates that active decay is already established within the tree's tissues. Fruiting bodies are the reproductive stage of fungi whose vegetative bodies extend into the tree.

132. C — A target is any person, property, or activity that could be affected by a failing tree or tree part. Targets include pedestrians, vehicles, buildings, utility lines, and outdoor activities. Without targets, even high failure likelihood does not produce high risk.

133. B — Target occupancy rate formalizes the frequency and duration of target presence within the potential strike zone. Higher occupancy contributes to higher overall risk because failures are more likely to coincide with target presence.

134. D — A new lean combined with fresh soil cracking on the opposite side indicates root plate movement and elevated risk of uprooting failure. Trees showing these signs should be considered at imminent risk. Immediate action may be warranted.

135. C — Sounding the trunk with a mallet produces a solid ringing sound over intact wood and a dull hollow sound over decayed or hollow areas. It is a simple but useful technique for detecting large decay columns that might otherwise be missed visually.

136. A — The TRAQ risk matrix combines likelihood of failure and impact (probability that failure will occur and strike a target) with consequences of failure (severity if impact occurs). The combination produces the overall risk rating.

137. D — A probable likelihood of failure in TRAQ means failure is likely to occur during the assessment time frame under normal conditions. The four levels are improbable, possible, probable, and imminent.

138. B — The severe consequence level in TRAQ applies to catastrophic property damage, serious injury, or death. Minor consequences involve minor damage or injury; significant consequences fall between.

139. A — A tree with an internal cavity may still be structurally sound if sufficient intact wood remains around the cavity perimeter to resist bending forces. A common guideline holds that at least one-third of the diameter should remain as sound wood.

140. C — Consequences of failure depend on the size of the falling part, the height from which it would fall, and the nature of the target it would strike — all three factors together. A single factor in isolation cannot predict severity.

141. D — Residual risk is the risk that remains after mitigation measures have been implemented. No mitigation eliminates risk entirely — pruned trees can still fail, cabled unions can still split. Clients must understand they are choosing acceptable risk levels.

142. B — A professional report should document scope, defects, targets, mitigation, and residual risk — but not a removal recommendation for every tree. Recommendations must be proportional to actual risk. Blanket removal recommendations damage professional credibility.

143. A — Cabling and bracing provide supplemental support that reduces but does not eliminate structural risk. The installations require ongoing inspection and maintenance. They are appropriate when defects cannot be addressed by pruning alone.

144. C — Effective client communication uses plain language, presents options rather than ultimatums, and respects the owner's decision-making authority. Technical jargon, pressure tactics, and withholding information all damage credibility.

145. B — Root defects are difficult to evaluate because roots are below ground and cannot be directly observed. Arborists rely on indirect indicators such as root plate movement, fungal fruiting bodies at the flare, and construction history.

146. D — Healthy rounded callus tissue around a small old wound indicates successful compartmentalization and closure. This is evidence of normal healing, not a structural defect. The tree has successfully walled off the original injury.

147. A — Reduction pruning to decrease end weight on an overextended branch is a standard mitigation for moderate risk from specific branch defects over targets. It addresses the identified defect without removing the entire tree.

148. C — ANSI Z133 is the American National Standard for Arboricultural Operations — Safety Requirements and is the principal safety standard for tree care work. ANSI A300 addresses pruning; Z133 addresses safety.

149. B — The minimum approach distance for unqualified workers to energized distribution lines below 50 kV is 10 feet under ANSI Z133. This is the most commonly cited MAD figure and applies to most lines in residential and commercial tree work.

150. D — A qualified line-clearance arborist has completed specialized training in electrical hazards, safe work procedures near energized lines, use of insulated tools, and emergency response to electrical contact. This training cannot be acquired informally.

151. C — A climbing helmet must have a chin strap to retain the helmet during active climbing, rigging, and inverted positions. Traditional construction hard hats without chin straps can fall off during dynamic movement.

152. A — Chainsaw-resistant leg protection contains cut-resistant fibers (ballistic nylon or aramid) that clog the chain of a running saw on contact, stopping the chain before it reaches the leg. The protection dramatically reduces injury severity.

153. B — OSHA requires hearing protection when noise levels exceed 85 decibels, and chainsaw operation routinely produces noise well above this threshold. Repeated exposure without protection causes progressive and irreversible hearing loss.

154. D — A proper job briefing covers work scope, hazards, procedures and precautions, required PPE, and emergency response procedures. It is required under ANSI Z133 and is not optional. Briefings prevent predictable mistakes.

155. A — ANSI Z133 requires aerial rescue capability on essentially every climbing operation with a crew — at least one worker other than the climber must be trained and equipped to perform a rescue. Outside emergency services alone are inadequate.

156. C — Suspension trauma develops when a climber remains motionless in a harness for an extended period, as reduced venous return causes blood to pool in the legs. It can become life-threatening within 30 minutes.

157. D — The kickback zone is the upper portion of the bar tip. Contact between this area and any object can trigger a violent upward and backward reaction. Awareness of tip position throughout every cut is a foundational safety skill.

158. B — The chain brake is designed to stop the chain when activated manually by the front handguard or automatically by kickback motion. It is an essential safety feature that must be functional on every saw in service.

159. C — The left hand should grip the front handle with the thumb wrapped fully around the handle. This grip is stronger and provides better control if the saw moves unexpectedly. It is the standard grip for all chainsaw operation.

160. A — Two-handed operation is the standard practice for nearly all chainsaw use and is required except in specific climbing situations using top-handle saws. The standard grip provides maximum control and reduces injury risk.

161. B — Top-handle chainsaws are designed specifically for climbing arborist use up in the canopy, where compact size and potential one-handed operation are required. They should not be used by untrained workers or for ground-based work.

162. D — The chain catcher is a projection beneath the bar designed to catch the chain if it breaks or derails during operation, preventing it from whipping toward the operator. It is one of several safety features on modern chainsaws.

163. A — Working load limit is commonly calculated as approximately one-tenth of the tensile strength of rigging equipment. A rope with 14,000 pounds tensile strength has a WLL of about 1,400 pounds. This margin protects against shock loading and wear.

164. C — Shock loading is the dynamic force generated when a falling piece is suddenly caught by the rigging rope. Peak forces can be many times the static weight of the piece depending on fall distance and system elasticity.

165. D — Allowing controlled slip through a friction device such as a Port-a-Wrap distributes the energy of the catch over time rather than stopping the load instantly. The result is a dramatically lower peak force compared to a hard tie-off.

166. B — A block redirecting a rigging load over an anchor experiences approximately twice the force of the load itself, because the block holds both the lifting side and holding side of the rope simultaneously. This doubling is a routine source of anchor failure.

167. A — The hinge is the strip of wood between the notch and the back cut that controls fall direction as the tree begins to fall. It must remain intact to guide the tree along the intended fall line. Hinge width should be approximately 10% of trunk diameter.

168. C — An escape route must be planned and cleared before cutting begins and followed immediately as the tree starts to fall. The route should lead away from the tree at about 45 degrees from the fall line on the opposite side.

169. B — Barber chair is a vertical splitting of the trunk upward along the grain during the back cut, caused by cutting the hinge too thin or making the back cut too slowly. It can propel trunk sections backward at high speed.

170. D — Chipper operators should feed branches butt end first while standing to the side of the infeed. Standing to the side avoids struck-by hazards from branches that flex or kick back. Standing directly behind is a recurring cause of serious injury.

171. A — Aerial lift operators must maintain the minimum approach distance with both the bucket and the boom, because the metal boom is an excellent conductor and can carry electricity from a contacted line throughout the machine.

172. C — PPE must be inspected before every use, and items showing damage, wear, or contamination must be retired immediately and replaced. Continuing to use compromised PPE provides reduced or no protection. Annual inspection alone is inadequate.

173. D — ANSI Z133 requires climbing ropes to have a tensile strength of at least 5,400 pounds for arboricultural climbing applications. This value provides the margin needed for the dynamic loads generated during climbing and rigging.

174. B — A properly tied friction hitch must grip the rope reliably under load while permitting controlled adjustment when the climber changes position. A hitch that slips under load is unsafe; one that locks rigidly prevents smooth climbing.

175. C — The feed control bar on a wood chipper is a safety device that stops the feed rollers when pressed, allowing the operator to halt material feed in an emergency. It must be functional and within reach.

176. A — Chainsaws should be stopped and allowed to cool briefly before refueling. Refueling a running or hot saw risks fire from spilled fuel contacting hot components. This is one of the basic safety rules of power equipment handling.

177. D — A first aid kit should be available on every tree care worksite and stocked appropriately for the hazards of the work. This includes supplies for treating chainsaw lacerations, bleeding, and minor injuries that occur routinely.

178. B — Urban trees reduce the urban heat island effect through shading of surfaces and evapotranspiration cooling. Paved cities can be 5 to 10 degrees warmer than surrounding areas, and tree canopy substantially reduces this difference.

179. A — A complete tree inventory records every tree within the defined inventory area, with information on species, size, condition, location, and management needs. Sample inventories cover a statistically representative subset.

180. C — The i-Tree suite developed by the USDA Forest Service allows communities to estimate the dollar value of ecosystem services — stormwater interception, air quality improvement, carbon sequestration, and energy savings — provided by their tree populations.

181. B — The trunk formula method is used when a tree is too large to be practically replaced by nursery stock. It calculates value from trunk cross-sectional area adjusted by species, condition, and location ratings.

182. D — Tree protection ordinances typically require permits for removal of protected trees above a specified size threshold, with penalties for unauthorized removal. Specific provisions vary between jurisdictions.

183. C — Canopy cover goals are typically expressed as the percentage of land area covered by tree canopy, measured through aerial imagery analysis. They provide a high-level metric for tracking urban forest size and communicating progress.

184. A — Tree City USA requires a community forestry budget of at least two dollars per capita annually, along with a tree board, tree care ordinance, and Arbor Day observance. The program recognizes baseline commitment to urban forestry.

185. D — Species rating in plant appraisal reflects the desirability and suitability of the species in the local area. High-quality species well adapted to the location receive higher ratings; invasive or poorly suited species receive lower ones.

186. B — Effective communication with property owners uses plain language and respects the owner's decision-making authority. Technical jargon, pressure tactics, and refusal to share information all damage credibility. The client makes the final decision.

187. A — Multiple studies have found improved mental health outcomes and reduced stress for residents of neighborhoods with more trees, along with faster recovery from illness and increased physical activity. The human-health case is increasingly central.

188. C — A budget-focused council responds to the documented dollar value of ecosystem services and infrastructure savings, not to aesthetic arguments or staff preferences. Matching the message to the audience is basic professional communication.

189. B — Diverse plantings following the 10-20-30 rule protect communities against catastrophic pest loss when species-, genus-, or family-specific pests arrive. Dutch elm disease and emerald ash borer illustrate why diversity matters.

190. D — ANSI A300 is the American National Standard for Tree Care Operations and governs pruning and maintenance practices in the United States. ANSI Z133 addresses worker safety; the two complement each other.

191. A — The five ANSI A300 primary pruning objectives are cleaning, thinning, raising, reducing, and restoration. Topping is explicitly prohibited, not included as an objective. Topping creates large wounds and weakly attached sprouts.

192. C — Tree risk assessment reports communicate findings, management options, and residual risks to property owners so they can make informed decisions. They are not insurance documents or market valuations. Clear communication is the central purpose.

193. D — The ISA Certified Arborist credential indicates competency in the fundamentals of arboriculture through examination and continuing education requirements. It is not a state license and does not replace specialized credentials. It is a baseline professional standard.

194. B — Professional ethics guide arborists in their conduct toward clients, colleagues, and the public. Ethics are the foundation of professional credibility. They are not regulatory documents or billing standards.

195. A — When a client request violates accepted standards, the professional response is to decline the work and explain the concern. Compliance for fees or in writing does not remove professional responsibility. Client education is part of professional practice.

196. C — The arborist's role in public safety is identifying, communicating, and mitigating risks to acceptable levels. No arborist can guarantee zero risk or eliminate every defect. Risk management is an ongoing process, not a one-time fix.

197. B — Continuing education maintains current knowledge of evolving best practices and is required to keep the ISA Certified Arborist credential active. CEU requirements ensure certificants remain current with the profession. Knowledge in arboriculture changes continuously.

198. D — Tree removal is the correct recommendation when risks cannot be acceptably mitigated through pruning, cabling, or other measures. Removal is not driven by age, minor defects, or client preference alone. Risk assessment guides the decision.

199. A — Honest communication of uncertainty is a professional obligation and supports informed client decisions. Withholding findings or forcing artificial certainty undermines credibility. Clients deserve the truth about what is and is not known.

200. C — The foundational principle of tree care is providing the tree's best long-term welfare while meeting owner objectives safely. Profit and speed are secondary considerations. This principle guides every professional decision an arborist makes.