PRACTICE EXAM 10: ISA CERTIFIED ARBORIST SIMULATION

PRACTICE EXAM 10 — QUESTIONS 1–200

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

1. Which of the following statements about the vascular cambium is correct?

A. It is composed of dead cells with deposited extractives

B. It conducts water directly from roots to leaves

C. It produces new xylem inward and new phloem outward

D. It is the same tissue as the outer corky bark

2. Which statement about xylem conducting cells is true?

A. They are dead at functional maturity and form hollow conduits

B. They remain alive and require continuous respiration

C. They contain chlorophyll for photosynthesis

D. They are replaced every few days in growing trees

3. The percentage of a tree's pore space in an ideal mineral soil is approximately:

A. 10 percent of the total volume

B. 50 percent of the total volume

C. 75 percent of the total volume

D. 90 percent of the total volume

4. Which statement about tree respiration is correct?

A. It occurs only in leaves during daylight hours

B. It produces sugars from carbon dioxide and water

C. It is restricted to dormant winter periods

D. It occurs continuously in every living cell of the tree

5. The correct driving force for upward water movement in a tree is:

A. Active cellular pumping in the root cortex

B. Atmospheric pressure pushing water upward

C. Tension created by evaporation at leaf surfaces

D. Capillary rise through narrow vessel elements

6. Which statement about phloem is true?

A. It transports sugars from sources to sinks as living tissue

B. It transports water upward from roots to leaves

C. It is composed of dead cells at functional maturity

D. It is located only within the heartwood of mature trees

7. The vast majority of a mature tree's absorbing roots are found at a depth of approximately:

A. 60 to 72 inches in the subsoil layer

B. 36 to 48 inches in the deeper root zone

C. 24 to 36 inches below the dripline

D. The upper 12 to 18 inches of soil

8. Which statement about heartwood is correct?

A. It produces new phloem each growing season

B. It consists of dead cells with deposited extractives

C. It actively conducts most of the water to the canopy

D. It is the most metabolically active trunk tissue

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

A. Wall 4, the strongest of the four barriers

B. Wall 1, resisting vertical spread through xylem

C. Wall 2, resisting inward spread through growth rings

D. Wall 3, resisting lateral spread through ray tissue

10. Which statement about apical dominance is true?

A. It is controlled primarily by gravity acting on lower buds

B. It is regulated by cytokinin produced in the leaves

C. It is maintained by auxin produced at the shoot tip

D. It is independent of plant hormones in young trees

11. When in the growing season are a tree's carbohydrate reserves typically at their lowest?

A. Early autumn just before leaf drop

B. Midwinter during the deepest dormancy

C. Midsummer at peak photosynthesis

D. Late spring after new leaves have emerged

12. Which statement about mycorrhizal fungi is correct?

A. They produce antibiotics that kill all soil pathogens

B. They extend hyphae to expand root absorbing surface

C. They fix atmospheric nitrogen within root tissues

D. They decompose dead roots into available nutrients

13. Which statement about the cohesion-tension theory is true?

A. It relies on hydrogen bonding holding water columns under tension

B. It depends on active pumping by cells in the root cortex

C. It is driven by osmotic pressure within xylem vessels

D. It requires metabolic energy from the trunk tissues

14. When stomata close during drought, the most direct consequence is:

A. An immediate increase in root water uptake

B. An acceleration of cellular respiration in roots

C. A simultaneous reduction of transpiration and photosynthesis

D. A flush of new growth in the apical buds

15. Which of the following is NOT a function of leaf stomata?

A. Allowing carbon dioxide to enter for photosynthesis

B. Anchoring the leaf blade firmly to the petiole

C. Releasing water vapor through transpiration

D. Releasing oxygen produced during photosynthesis

16. A tree responding to wind sway typically develops:

A. Thinner more flexible bark on the trunk

B. Smaller leaves to reduce wind resistance

C. Deeper taproots than sheltered trees

D. Greater trunk taper and reaction wood

17. Which statement about a successfully compartmentalized wound is correct?

A. New wood and callus form around the original injury

B. Decay continues to spread throughout the heartwood

C. The wood beneath the callus becomes functional sapwood

D. The tree has no remaining structural risk at that point

18. Which statement about a girdled tree is true?

A. It dies because xylem can no longer conduct water upward

B. It dies because oxygen cannot reach the internal cambium

C. It dies because phloem can no longer transport sugars to roots

D. It dies because nitrogen cannot reach the upper canopy

19. Which of the following is correct regarding tree respiration and photosynthesis?

A. Respiration produces sugars and photosynthesis consumes them

B. Both processes occur only during daylight hours in the leaves

C. Both processes are restricted to the dormant winter season

D. Respiration consumes sugars and photosynthesis produces them

20. The MAD Horse mnemonic identifies temperate genera with which trait?

A. Palmately compound leaves with five or more leaflets

B. Opposite leaf arrangement on the stems

C. Deciduous needle-like foliage in winter

D. Distinctive peeling bark patterns

21. Which statement about red oaks is correct?

A. They have pointed lobes with bristle tips and two-year acorns

B. They have rounded lobes without bristles and one-year acorns

C. They produce paired winged samaras as fruits

D. They are evergreen throughout much of North America

22. The correct written format of a scientific name in print is:

A. ACER RUBRUM in bold all capitals

B. *Acer Rubrum* with both words capitalized

C. *Acer rubrum* with the genus capitalized and italicized

D. acer rubrum in all lowercase without italics

23. Which statement about cultivar names is true?

A. They are italicized along with the species name

B. They are written in double quotation marks

C. They indicate a botanical variety from wild populations

D. They are written in single quotation marks and not italicized

24. The 10-20-30 rule of urban tree diversity limits which three taxonomic levels?

A. Order, family, and genus combined

B. Species, genus, and family of the planting

C. Cultivar, species, and order combined

D. Variety, subspecies, and class combined

25. Which statement about tree of heaven (*Ailanthus altissima*) is correct?

A. It is classified as a non-native invasive species in eastern North America

B. It is a native understory species of eastern forests

C. It is a desirable ornamental with no invasive tendencies

D. It is endangered and protected by federal law

26. A tree appropriate for planting beneath a 30-foot distribution power line should have a mature height of:

A. Approximately 45 feet to reach the wires

B. Exactly 30 feet to touch the conductors

C. Under 25 feet to stay safely below the line

D. Over 60 feet to grow past the wires

27. Which of the following groups have alternate leaf arrangement?

A. Maple, ash, and dogwood in mixed stands

B. Oak, hickory, and beech in eastern forests

C. Horse chestnut, buckeye, and dogwood

D. Catalpa, paulownia, and viburnum

28. Which statement about a pinnately compound leaf is correct?

A. It has leaflets clustered at a single attachment point

B. It consists of one continuous unlobed blade

C. It is borne directly on the woody stem with no rachis

D. It has leaflets arranged along two sides of a central rachis

29. Which statement about Right Tree, Right Place is true?

A. Its primary goal is matching mature tree characteristics to site conditions

B. Its primary goal is matching nursery price to homeowner budget

C. Its primary goal is matching leaf color to landscape style

D. Its primary goal is matching trunk caliper to planting depth

30. A tree with mottled tan and gray peeling bark and broad palmate leaves is most likely:

A. Sugar maple in the soapberry family

B. Norway maple introduced from Europe

C. American sycamore in the plane family

D. Shagbark hickory in the walnut family

31. Which plant family does *Fraxinus* (the ash genus) belong to?

A. Pinaceae, the pine family

B. Rosaceae, the rose family

C. Sapindaceae, the soapberry family

D. Oleaceae, the olive family

32. Which statement about winter tree identification is correct?

A. It depends primarily on new spring foliage color

B. It relies on bud shape, twig features, and bark character

C. It requires laboratory analysis of wood samples

D. It is impossible without leaves and flowers present

33. Which statement about native tree species is most accurate?

A. They are automatically immune to all local pests

B. They always grow faster than non-native alternatives

C. They are co-adapted to local climate, soils, and ecology

D. They always remain shorter than imported species

34. The pH scale for soil chemistry ranges from:

A. 0 to 14, with 7 as neutral

B. 1 to 10, with 5 as neutral

C. 0 to 7, with 3.5 as neutral

D. 0 to 20, with 10 as neutral

35. Which statement about loam soil is correct?

A. It is composed entirely of fine clay particles

B. It consists of nearly pure sand with little silt

C. It is dominated by organic matter with no mineral fraction

D. It has balanced proportions of sand, silt, and clay

36. Which statement about cation exchange capacity (CEC) is true?

A. It depends primarily on annual rainfall at the site

B. It is determined mainly by clay content and organic matter

C. It is governed by soil temperature through the year

D. It depends solely on the depth of the topsoil horizon

37. Which statement about soil compaction is correct?

A. It reduces pore space and starves roots of oxygen

B. It increases cation exchange capacity dramatically

C. It improves nutrient uptake in urban soils

D. It raises soil oxygen levels near the root surface

38. A proper mulch ring around a landscape tree should be how many inches deep?

A. Six to eight inches piled against the trunk

B. Less than half an inch as a dusting

C. Two to four inches with the trunk kept clear

D. Ten to twelve inches for full weed control

39. A perc test that shows water taking 36 hours to drain indicates that drainage is:

A. Excessive for most tree species

B. Inadequate for most tree species

C. Ideal for any species available

D. Typical of healthy forest soils

40. Which statement about soil texture is correct?

A. It changes easily with simple amendments

B. It is improved dramatically by adding sand to clay

C. It can be corrected with annual tilling

D. It is essentially permanent and cannot be meaningfully changed

41. A bulk density of 1.8 g/cm³ in mineral soil most accurately indicates:

A. Loose soil structure supporting healthy root growth

B. Severe compaction that halts most root growth

C. The optimal bulk density for root expansion

D. Normal forest topsoil condition after rainfall

42. Which statement about organic matter is correct?

A. Maintaining a continuous mulch layer is the most effective way to build it

B. Deep annual tilling rapidly increases it in landscape beds

C. Applications of fine sand significantly increase it over time

D. Foliar fertilizer sprays contribute directly to soil organic matter

43. A composite soil sample is preferred over a single grab sample because it:

A. Is much cheaper for the laboratory to process

B. Requires no specialized sampling equipment

C. Is much faster to collect in the field

D. Averages variation across the sampled area

44. Which statement about mulch and tree roots is correct?

A. Mulch should be piled high against the trunk for best results

B. Mulch supplies all of a tree's nitrogen needs each year

C. Mulch conserves moisture, moderates temperature, and suppresses weeds

D. Mulch should be replaced annually with plastic sheeting

45. Iron chlorosis in a pin oak growing in alkaline soil is most commonly caused by:

A. Nitrogen deficiency from nearby lawn competition

B. High soil pH making iron chemically unavailable

C. Excessive potassium suppressing magnesium uptake

D. Sulfur excess from a nearby industrial source

46. The width of a planting hole for a container-grown tree should be approximately:

A. Two to three times the diameter of the root ball

B. Exactly the diameter of the root ball

C. Half the diameter of the root ball

D. Ten times the diameter of the root ball

47. Which statement about the root flare of a newly planted tree is correct?

A. It should be buried six inches below the surrounding grade

B. It should be covered with several inches of mulch directly

C. It should be set twelve inches below the lawn surface

D. It should be set at or slightly above the surrounding grade

48. Current best practice for backfill in a planting hole is to use:

A. Sterilized purchased potting mix only

B. Equal parts peat moss and perlite

C. The unamended native soil excavated from the hole

D. Coarse builder's sand with added agricultural lime

49. The rule of thumb for tree establishment time is approximately one year per:

A. Inch of trunk caliper at the time of planting

B. Foot of mature height the species reaches

C. Square foot of crown spread at planting

D. Inch of branch diameter on scaffold limbs

50. Which statement about staking newly planted trees is correct?

A. It should be permanent for the entire life of the tree

B. It should be used only when necessary and removed within a year

C. It should be tightened progressively as the tree grows

D. It should be required on every newly planted specimen

51. Which statement about circling roots at planting is true?

A. They should be left intact to avoid damaging root tips

B. They should be coated with rooting hormone before backfilling

C. They should be cut or straightened before placing in the hole

D. They should be treated with a commercial wound dressing

52. Which statement about wire baskets on B&B trees is correct?

A. They should be left completely intact to support the ball

B. They should be entirely removed before lowering the tree

C. They should be replaced with plastic mesh before planting

D. They should be cut and removed at least from the upper portion

53. The most common serious error when planting container-grown trees is:

A. Watering too lightly during the first week after planting

B. Setting the root ball too deep and burying the root flare

C. Using only native soil as the backfill material

D. Failing to install stakes on all four sides

54. Which statement about watering a newly planted tree is correct?

A. The root ball should be kept consistently moist but not saturated

B. The root ball should be saturated continuously for the first month

C. The root ball should be kept completely dry to force deep rooting

D. The root ball should be moist only on the south-facing side

55. Which statement about fertilizing a newly planted tree during the first year is true?

A. It is the single most important practice for transplant survival

B. It is required by most municipal planting specifications

C. It is generally unnecessary and sometimes counterproductive

D. It is best applied as a foliar spray to expanding leaves

56. The preferred season for transplanting most deciduous trees is:

A. Mid-summer during peak active growth

B. Immediately after leaf expansion in spring

C. Any month with adequate irrigation available

D. Dormancy in late fall or early spring

57. Advance root pruning before a planned transplant serves to:

A. Reduce the total weight of the future root ball

B. Encourage new fibrous roots inside the future ball line

C. Eliminate the need for any future irrigation

D. Prevent suckers from emerging at the trunk base

58. Which statement about twine tied around the trunk of a B&B tree is correct?

A. It should be removed completely to prevent future girdling

B. It should be tightened further for additional support

C. It should be left in place because it decomposes quickly

D. It should be replaced with heavier cord before planting

59. A balled-and-burlapped tree should be lifted by:

A. Wrapping the crown with lifting straps

B. Grasping the trunk firmly with two hands

C. Supporting the root ball from underneath

D. Pulling on the burlap from the top of the ball

60. Which of the following is NOT a benefit of mulching a newly planted tree?

A. Conserving moisture in the root zone

B. Moderating soil temperatures over time

C. Suppressing competing weeds near the trunk

D. Supplying all the tree's nitrogen needs each year

61. Which statement about planting hole depth is correct?

A. It should equal the height from root flare to ball bottom

B. It should be at least twice the height of the root ball

C. It should reach below the tree's lowest scaffold branches

D. It should include a gravel drainage layer at the bottom

62. A newly delivered nursery tree should be inspected for:

A. The brand name printed on the container only

B. The exact weight printed on the delivery manifest

C. The width of the wire basket and burlap only

D. Trunk, crown, root flare, and root ball condition

63. A newly planted tree that fails to leaf out the following spring most likely suffered from:

A. Inadequate mulch depth at the trunk base

B. Root ball desiccation during handling

C. Cold temperatures during normal dormancy

D. A foliar disease affecting expanding buds

64. Which standard governs tree pruning and maintenance practices in the United States?

A. ANSI Z133 covering arboricultural safety requirements

B. ANSI Z60.1 covering nursery stock specifications

C. ANSI A300 covering pruning and maintenance practices

D. ANSI Z89.1 covering head protection only

65. Which statement about a correct pruning cut is true?

A. It is placed just outside the branch collar and bark ridge

B. It is placed flush with the parent stem for smoothness

C. It is placed six inches beyond the branch collar

D. It is placed at the midpoint of the branch length

66. Which statement about topping a mature shade tree is correct?

A. It requires specialty equipment most crews lack

B. It is permitted only under specific safety standards

C. It is a generally acceptable practice when done carefully

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

67. The purpose of the three-cut method of branch removal is primarily to:

A. Reduce sawdust accumulation on the worksite

B. Speed up the total cutting time per branch

C. Prevent bark from tearing down the trunk

D. Allow the use of a smaller chainsaw bar

68. The first cut in the three-cut method is made:

A. From above at the exact final cut location

B. On the underside of the branch, beyond the final cut

C. Straight down through the top of the branch

D. Parallel to the trunk to score the bark

69. The cleaning pruning objective involves selective removal of:

A. Dead, dying, diseased, broken, or weakly attached branches

B. All interior live foliage from the crown

C. Every lateral branch crossing another branch

D. The outermost six inches of every scaffold branch

70. Which statement about a reduction cut is correct?

A. It leaves an arbitrary stub regardless of laterals

B. It is always made with hand pruners only

C. It removes only branches under one inch in diameter

D. It cuts back to a lateral large enough to assume the terminal role

71. Structural pruning provides the greatest long-term benefit when performed on:

A. Trees in their final decade of mature life

B. Mature trees with established canopies

C. Young trees during the juvenile growth phase

D. Recently planted trees during establishment

72. The maximum percentage of live foliage that should typically be removed from a mature tree in one session is approximately:

A. 25 to 30 percent of live foliage

B. 10 to 15 percent of live foliage

C. 40 to 50 percent of live foliage

D. There is no upper limit for healthy mature trees

73. Which statement about the branch bark ridge is correct?

A. It is a raised line of bark on the upper side of a branch union

B. It is a barrier located inside the heartwood of the tree

C. It is the outer corky layer covering the trunk surface

D. It is a layer of dead bark within the sapwood zone

74. Which statement about lion-tailing is true?

A. It is a recommended practice for reducing wind loads

B. It involves the removal of only dead branches

C. It is the same as a proper cleaning objective

D. It strips interior foliage and concentrates weight at branch ends

75. Pollarding is a traditional pruning technique that requires:

A. Removal of the central leader during establishment

B. Annual application of wound dressing to every cut

C. Repeated cuts at the same framework points on a schedule

D. Complete heading back of the entire canopy at once

76. The restoration pruning objective applies to trees that have been:

A. Recently planted in their establishment phase

B. Topped, vandalized, or severely storm damaged

C. Selected for removal at project completion

D. Designated as historic specimens by ordinance

77. Which statement about wound dressings on pruning cuts is correct?

A. They are required under the current ANSI A300 standard

B. They eliminate all risk of decay organisms entering

C. They accelerate compartmentalization across all species

D. They provide minimal benefit and sometimes slow healing

78. In oak wilt regions, oaks should ideally be pruned during:

A. Dormancy to reduce disease transmission risk

B. Warm summer months to speed wound closure

C. Wet rainy days when beetles are inactive

D. Any time of year with sterilized tools

79. Which statement about subordination pruning is correct?

A. It eliminates the central leader entirely from the tree

B. It removes all epicormic sprouts from the trunk

C. It reduces the growth of a competing stem in favor of a leader

D. It cuts every lateral branch to equal lengths

80. Which statement about a flush cut is true?

A. It is the preferred method for removing large limbs cleanly

B. It removes the branch collar and eliminates Wall 4 tissue

C. It leaves a short projecting stub beyond the collar

D. It is required by ANSI A300 for all large branch removals

81. Which statement about a stub cut is correct?

A. It leaves dead wood that cannot be compartmentalized

B. It is the preferred finishing cut after a three-cut removal

C. It is equivalent to a proper reduction cut in outcome

D. It helps the tree produce stronger new sprouts

82. Bypass pruning blades are preferred over anvil blades for living wood because they:

A. Apply more force at a lower cutting angle

B. Can be sharpened without removing them

C. Cut cleanly without crushing the stem

D. Are lighter and reduce operator fatigue overall

83. A pole pruner is most appropriate for:

A. Felling small trees on flat terrain

B. Cutting all lower branches on mature trees

C. Branches over six inches in diameter overhead

D. Small branches out of reach without climbing

84. When a client requests 50 percent live foliage removal from a mature tree, the professional response is to:

A. Comply using exclusively bypass hand pruners

B. Explain that the request violates accepted standards

C. Agree but charge double for the additional work

D. Remove only the smallest interior branches

85. Codominant stems with included bark should ideally be corrected:

A. Early, while stems and necessary cuts are small

B. After the tree has reached full structural maturity

C. By spraying the union with systemic fungicide

D. By removing the tree as a preventive measure

86. Which statement about the raise pruning objective is correct?

A. It increases the overall height of the tree crown

B. It lifts the tree with mechanical equipment

C. It removes lower branches for vertical clearance

D. It raises the soil grade around the tree trunk

87. Disinfecting pruning tools between cuts is most important when:

A. Performing routine pruning of any healthy tree

B. Pruning trees affected by contagious diseases

C. Working on healthy trees during the dormant season

D. Using hand pruners on small twigs only

88. Which of the following is NOT typically part of a professional pruning specification?

A. The identified pruning objective for the work

B. The percentage of live foliage to be removed

C. The diameter range of cuts to be made

D. The climber's personal stylistic preferences

89. Bypass loppers are most appropriate for branches with a diameter of up to approximately:

A. One and a half to two inches

B. Four to six inches across

C. Eight inches in diameter

D. One-quarter of an inch only

90. Which pruning objective covers the removal of a dead branch from a mature tree?

A. Reduce to lower the overall crown height

B. Raise to provide pedestrian clearance

C. Clean to remove dead and weak branches

D. Restore following previous storm damage

91. The single most important factor in whether a pruning wound closes successfully is:

A. The brand of cutting tool used by the climber

B. The weather conditions during the operation

C. The time of day when the cut is made

D. The placement of the cut relative to the branch collar

92. Which statement about the first step in diagnosing an unhealthy tree is correct?

A. It begins with applying broad-spectrum fungicide

B. It begins with identifying species and normal characteristics

C. It begins with immediate removal of the affected tree

D. It begins with laboratory sampling of all tissues

93. Which statement about a "sign" of a tree disease is true?

A. It is direct evidence of the causal agent itself

B. It is the tree's general response such as wilting

C. It is a description written in the inspection report

D. It is a homeowner's complaint about leaf appearance

94. Which statement about a "symptom" of a tree disorder is correct?

A. It is direct evidence of the causal agent itself

B. It is laboratory confirmation of a specific pathogen

C. It is the tree's response such as yellowing or wilting

D. It is a visible fruiting body of a fungal pathogen

95. A primary tree pest is best described as one that:

A. Cannot reproduce except under drought stress

B. Is found only in remote forested areas

C. Attacks only trees that are already weakened

D. Can kill healthy vigorous trees on its own

96. Emerald ash borer is classified as a primary pest because it:

A. Was introduced earlier than other wood borers

B. Successfully attacks healthy ash trees of all sizes

C. Reproduces only under drought stress conditions

D. Requires bark wounds to enter the host tree

97. Which statement about Integrated Pest Management (IPM) is correct?

A. It is a specific brand of organic pesticide formulation

B. It is a complete prohibition on all chemical control

C. It is a decision framework using monitoring, thresholds, and tactics

D. It is a method limited only to biological control agents

98. Fire blight is caused by a bacterium and affects which plant family?

A. Rosaceae including apples, pears, and hawthorns

B. Pinaceae including pines and firs

C. Sapindaceae including maples and horse chestnut

D. Fagaceae including oaks and beeches

99. Oak wilt spreads from tree to tree primarily by:

A. Wind dispersing spores over long distances

B. Soil nematodes feeding on the fine roots

C. Rain splashing from infected leaves downward

D. Root grafts and sap-feeding beetles at wounds

100. A tree with interveinal chlorosis on its newest leaves while older leaves remain green most likely has:

A. Nitrogen deficiency from lawn competition

B. Iron deficiency, often related to high soil pH

C. Excess rainfall causing root rot damage

D. Calcium toxicity from previous over-liming

101. Yellowing that begins on older inner leaves and progresses outward typically indicates deficiency of:

A. Nitrogen, which is a mobile macronutrient

B. Iron, which is an immobile micronutrient

C. Calcium, a structural secondary nutrient

D. Boron, a trace element for cell division

102. Cupping and twisting of new growth on a mature tree most likely indicates:

A. An active spider mite outbreak in the canopy

B. Normal seasonal fall color development

C. Drought stress during a dry summer period

D. Phenoxy herbicide drift or residual exposure

103. Delayed decline three years after nearby construction most likely results from:

A. A new invasive insect pest in the region

B. Normal aging unrelated to the construction work

C. Root damage during construction now exhausting reserves

D. Reduced rainfall during the dormant period

104. Which statement about anthracnose is correct?

A. It is a viral disease transmitted by aphid vectors

B. It is a fungal disease producing leaf spots and blotches

C. It is a bacterial infection of the vascular system

D. It is a nutrient disorder limited to new growth

105. Armillaria root rot is confirmed by finding:

A. White mycelial sheets beneath the bark of infected roots

B. Orange pustules on the upper surface of leaves

C. Sticky honeydew dripping from twig tips

D. Hollow tunnels carved into the heartwood cylinder

106. Dutch elm disease is spread primarily by:

A. Soil nematodes feeding on elm root systems

B. Wind blowing spores across long distances

C. Rain splash from infected foliage to others

D. Elm bark beetles and root grafts between trees

107. Trunk injection of a systemic insecticide is most appropriate for:

A. Small seedlings growing in container nurseries

B. High-value trees threatened by borers

C. Very young trees during establishment

D. Controlling weeds in the surrounding lawn

108. The statement "the label is the law" means that pesticide labels are:

A. Advisory documents to be followed when convenient

B. Expired one year after they are initially opened

C. Legally enforceable federal documents

D. Binding only during the first application

109. When a diagnosed disease has no effective treatment, the arborist should:

A. Communicate honestly and recommend appropriate management

B. Apply experimental treatments without informing the owner

C. Recommend removing all nearby trees as a precaution

D. Refuse to discuss the finding with the property owner

110. The Critical Root Zone (CRZ) of a mature tree is commonly calculated as a radius of:

A. Three feet per inch of trunk diameter

B. Two feet per inch of trunk diameter at breast height

C. Six inches per inch of trunk diameter

D. One foot per inch of trunk diameter at breast height

111. Tree protection fencing at a construction site should be placed at:

A. The trunk itself, encircling the bark closely

B. The CRZ boundary or further from the trunk

C. The dripline regardless of tree size or species

D. Half the distance between trunk and dripline

112. Which statement about concrete washout inside a Tree Protection Zone is correct?

A. The aggregate physically damages absorbing roots

B. The vibration disturbs fine root hairs

C. The high pH of the washwater can sterilize soil and kill roots

D. The cement sets up around root surfaces immediately

113. Raising the soil grade significantly over an existing tree's roots typically causes:

A. Immediate death within days of the activity

B. Stronger anchorage during major storms

C. Improved drainage benefits across the root zone

D. Gradual decline as buried roots lose oxygen access

114. The least damaging method for installing a utility line across a mature tree's root zone is generally:

A. Directional boring beneath the root zone

B. Conventional open-cut trenching at full depth

C. Mechanical auger boring downward from above

D. Surface installation directly on the soil

115. Which statement about material storage inside a Tree Protection Zone is correct?

A. It is permitted if the materials are lightweight only

B. It is required to free up other staging areas

C. It is prohibited because of soil compaction and root damage

D. It is allowed only during dry weather conditions

116. A pre-construction tree assessment ideally occurs:

A. After demolition has begun on the site

B. Before final design so findings can influence decisions

C. After foundations have been poured and graded

D. Only if trees show obvious symptoms later

117. An arborist supervising unavoidable root impacts during excavation should:

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

B. Allow the excavator to tear roots randomly

C. Apply wound sealant to every cut root surface

D. Wait until after excavation to assess damage

118. Post-construction care for a damaged tree should emphasize:

A. Aggressive crown reduction to balance roots

B. Heavy nitrogen fertilization to force new growth

C. Immediate trunk injection with systemic fungicide

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

119. Using the dripline alone as a tree protection boundary is usually inadequate because:

A. Drip patterns change shape between different seasons

B. Actual root systems extend well beyond the dripline

C. Drip lines cannot be enforced legally in most jurisdictions

D. Drip lines are too difficult to survey accurately

120. Delayed decline following construction damage typically becomes visible:

A. Within hours of the damaging activity ending

B. Only during the next major drought cycle

C. Months to several years after the triggering event

D. Always on the first anniversary of the construction

121. Which statement about tree protection fencing is correct?

A. It should be lightweight flagging tape crews can freely move

B. It should be short stakes spaced widely apart

C. It should be painted to match nearby buildings

D. It should be sturdy, visible, clearly marked, and maintained throughout

122. The single most effective action for protecting a mature tree during construction is:

A. Excluding all activity from the root zone entirely

B. Wrapping the trunk in protective foam padding

C. Pre-construction heavy fertilization of the root zone

D. Reducing the crown to balance expected root losses

123. Lowering the grade around an established tree primarily causes:

A. Improved drainage benefits to deeper roots

B. Increased nutrient access in newly exposed layers

C. Direct loss of functional roots along with the removed soil

D. Better wind anchorage for the remaining roots

124. A baseline tree condition report prepared before construction:

A. Eliminates any need for later monitoring work

B. Documents pre-existing conditions for later comparison

C. Is used exclusively for billing the client

D. Satisfies all regulatory requirements automatically

125. A tree showing no visible symptoms one year after construction:

A. Has fully recovered and needs no further attention

B. Is certain to fail during the next major storm

C. Can be safely fertilized heavily without concern

D. Should still be monitored for delayed decline

126. Hand or air excavation within a Tree Protection Zone is appropriate when:

A. Roots must be identified and preserved during work

B. Conventional trenching would be cheaper for the contractor

C. Speed is the most important consideration on site

D. The soil is too dry for mechanical equipment

127. A tree that has contacted an energized overhead line during construction should be:

A. Approached immediately for pruning by any worker

B. Treated as potentially energized until the utility confirms otherwise

C. Sprayed with water to dissipate any electrical charge

D. Removed quickly before the contact is reported

128. Which statement about tree risk in formal assessment is correct?

A. It equals the age of the tree multiplied by its height

B. It equals the total monetary value of the tree at market

C. It is the combination of likelihood of failure and severity of consequences

D. It equals the presence of any visible defect on a mature tree

129. A Level 2 tree risk assessment is typically:

A. A laboratory analysis of collected wood cores

B. A rapid drive-by screening of street trees

C. A theoretical model based on species alone

D. A detailed visual inspection of an individual tree

130. A Level 1 risk assessment is most appropriate for:

A. Rapid screening of large tree populations

B. Detailed evaluation of a single specimen of concern

C. Advanced internal diagnostics with instruments

D. Post-incident investigation of a failure event

131. Codominant stems with included bark are hazardous because the trapped bark:

A. Emits chemical signals that attract decay organisms

B. Acts as a reservoir for boring insect larvae

C. Prevents formation of a strong structural union

D. Alters the tree's center of gravity over time

132. The presence of a fungal fruiting body on a trunk indicates:

A. A healthy mycorrhizal partnership beneath the bark

B. Active decay already established within the tree

C. Normal seasonal shedding of outer bark layers

D. Excess nitrogen from recent fertilization work

133. A target in tree risk assessment is best defined as:

A. Any person, property, or activity affected by failure

B. A specific branch identified for pruning removal

C. A zone where the tree is expected to fall

D. An area of decay that has become externally visible

134. Target occupancy rate refers to:

A. The number of trees per acre in a given area

B. The age of nearby structures beneath the canopy

C. The total value of surrounding real estate

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

135. A new lean in a previously upright tree, with fresh soil cracking on the opposite side, indicates:

A. Normal phototropic adjustment toward sunlight

B. A cosmetic change without structural meaning

C. Root plate movement and elevated uprooting risk

D. Seasonal soil movement unrelated to the tree

136. Sounding the trunk with a mallet is useful for:

A. Measuring nitrogen content of the trunk wood

B. Detecting hollow areas through changes in sound

C. Identifying the species from the sound alone

D. Locating overwintering insects in the bark

137. The TRAQ risk matrix combines which two main dimensions?

A. Tree species and trunk diameter at breast height

B. Site drainage and measured soil pH

C. Property value and the tree's age in years

D. Likelihood of failure and impact with consequences

138. A "probable" likelihood of failure in TRAQ means:

A. Failure is likely to occur during the assessment period

B. Failure has already occurred or is currently imminent

C. Failure is unlikely but remains theoretically possible

D. Failure cannot occur under any foreseeable conditions

139. The "severe" consequence level in TRAQ applies to failures that produce:

A. Minor property damage easily repaired at low cost

B. Moderate damage with no significant injury to people

C. Catastrophic damage, serious injury, or death

D. No measurable effect on any nearby targets

140. A tree with an internal cavity may still be structurally sound if:

A. The cavity drains rainwater quickly after storms

B. Sufficient intact wood remains around the perimeter

C. The cavity is smaller than four inches in width

D. The cavity is located above six feet from grade

141. Consequences of failure depend on:

A. The size of the part, fall height, and nature of the target

B. Only the total weight of the falling tree part

C. Only the distance between tree and nearest structure

D. Only the calendar age of the tree at failure

142. Which statement about residual risk is correct?

A. It is the cost of insurance premiums on the tree

B. It is the risk only visible after a tree is removed

C. It is the risk during the mitigation work itself

D. It is the risk remaining after mitigation has been implemented

143. A professional risk assessment report should include all of the following EXCEPT:

A. The scope of the assessment performed

B. A removal recommendation for every tree examined

C. Identified defects and nearby targets

D. Recommended mitigation and residual risk

144. Level 3 risk assessment tools typically include:

A. Standard measuring tape and simple ground observation

B. Color photographs taken from a moving vehicle

C. Resistograph drilling and sonic tomography

D. Basic hand pruners and a small rubber mallet

145. Which statement about cabling and bracing systems is correct?

A. They reduce but do not eliminate structural risk

B. They eliminate all structural risk on the union completely

C. They are required on every mature tree by ANSI A300

D. They need no further inspection after installation

146. When communicating risk findings to a property owner, the arborist should:

A. Use highly technical jargon to establish credibility

B. Recommend only the most expensive option available

C. Withhold uncertain information to avoid worry

D. Use plain language and respect the owner's decisions

147. Root defects are difficult to evaluate during risk assessment because roots:

A. Always heal spontaneously on their own

B. Are only found in young trees recently planted

C. Are below ground and not directly observable

D. Never produce any above-ground symptoms

148. Which of the following is NOT a structural defect?

A. A codominant stem with significant included bark

B. A healthy rounded callus around an old small wound

C. An active vertical crack exposing internal wood

D. A large dead scaffold limb above an occupied area

149. Appropriate mitigation for a moderate-risk branch overhanging a driveway is:

A. Reduction pruning to decrease end weight on the limb

B. Removing the entire tree as a preventive measure

C. Ignoring the situation until the branch actually fails

D. Cabling every branch in the entire crown of the tree

150. The principal safety standard for arboricultural operations in the United States is:

A. ANSI A300 covering pruning practices

B. ANSI Z60.1 covering nursery stock

C. OSHA 29 CFR 1926 for general construction

D. ANSI Z133 covering arboricultural safety requirements

151. The minimum approach distance for an unqualified worker to an energized distribution line below 50 kV is approximately:

A. Three feet in any direction

B. Ten feet in any direction

C. Twenty-five feet in any direction

D. Five feet in any direction

152. A qualified line-clearance arborist differs from an unqualified worker in that the qualified arborist has:

A. General experience in landscape design work

B. A current license to operate a bucket truck

C. Specialized training in electrical hazards and line clearance

D. Personal ownership of insulated rubber gloves

153. A climbing helmet used for arboricultural work must include:

A. A chin strap to retain the helmet during climbing

B. A wide brim for blocking direct sunlight

C. An open face design for peripheral vision

D. Reflective tape covering every external surface

154. Chainsaw-resistant leg protection works by:

A. Activating an electromagnetic brake in the saw

B. Reflecting the moving chain away from the skin

C. Producing an audible warning to the operator

D. Containing fibers that clog the chain on contact

155. Hearing protection is generally required under OSHA when noise levels exceed approximately:

A. 30 decibels of normal conversation

B. 85 decibels of typical chainsaw operation

C. 50 decibels of quiet outdoor activity

D. 120 decibels of extreme machinery use

156. A proper pre-work job briefing should cover:

A. Only the names of all crew members present

B. Only the pricing of the day's planned work

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

D. Only the lunch break schedule for the crew

157. ANSI Z133 requires aerial rescue capability on a climbing crew:

A. Only when working trees over 100 feet in height

B. Only when electrical hazards are present at the site

C. Only on weekends and holidays when EMS is delayed

D. For essentially all climbing operations with a crew

158. Suspension trauma can develop in a climber who:

A. Remains motionless in a harness for an extended time

B. Ascends a stationary line too quickly to the canopy

C. Uses a harness that fits too tightly at the waist

D. Switches between rope systems during a climb

159. The kickback zone of a chainsaw is located at:

A. The bottom edge of the bar near the powerhead

B. The upper portion of the bar tip

C. The middle of the cutting bar during use

D. The rear handle near the throttle control

160. The chainsaw chain brake is designed to:

A. Slow the chain to a smooth idle when not cutting

B. Reduce vibration transmitted to the operator

C. Stop the chain when activated by kickback or hand

D. Prevent engine flooding during cold-weather starts

161. Which statement about the proper left-hand grip on a chainsaw is correct?

A. Only fingertip contact allows quick release

B. Loose contact absorbs engine vibration

C. Palm contact with thumb alongside the handle is preferred

D. The thumb should be wrapped fully around the front handle

162. Two-handed operation of a chainsaw is:

A. The standard practice for nearly all saw use

B. Required only for felling very large mature trees

C. Optional based on operator preference and skill

D. Reserved only for cuts above the operator's head

163. Top-handle chainsaws are designed specifically for:

A. Cutting firewood at a residential woodlot

B. Climbing arborist use up in the canopy

C. Bucking large logs while standing on the ground

D. Felling full-size mature trees in forestry

164. The chain catcher on a chainsaw is designed to:

A. Sharpen the chain automatically during use

B. Lubricate the chain during long cuts

C. Catch the chain if it breaks during cutting

D. Secure the chain to the bar during transport

165. The working load limit of rigging equipment is commonly calculated as approximately what fraction of the tensile strength?

A. One-half of the rated tensile strength

B. Nine-tenths of the rated tensile strength

C. Equal to the rated tensile strength itself

D. One-tenth of the rated tensile strength

166. Shock loading in rigging refers to:

A. Dynamic forces from a falling piece suddenly caught

B. The static weight of the largest piece handled

C. Initial lifting force applied to a cut piece

D. Electrical charge building up in a dry rope

167. The most effective way to reduce shock loading during a rigging catch is to:

A. Tie the rigging line to a hard anchor with no slip

B. Use the smallest-diameter rope that fits the load

C. Use a friction device to allow controlled slip

D. Position the ground worker beneath the falling piece

168. A block redirecting a rigging load over an anchor experiences approximately how much force relative to the load itself?

A. Half the force of the load itself

B. Twice the force of the load itself

C. Exactly the force of the load itself

D. No additional force when properly installed

169. The hinge in a standard felling cut:

A. Must be cut completely through before the tree falls

B. Is needed only for hollow or decayed trees

C. Is formed only by the first notch cut from the front

D. Controls fall direction as the tree commits to falling

170. An escape route during felling operations should:

A. Be planned and cleared before cutting begins

B. Lead directly beneath the falling tree

C. Be improvised at the moment of the fall

D. Always be exactly straight behind the feller

171. "Barber chair" in tree felling refers to:

A. A resting position taken between difficult cuts

B. A decorative form intentionally left in the stump

C. Vertical splitting of the trunk during the back cut

D. A specialty chain used for resinous softwood

172. Chipper operators should feed branches into the machine:

A. Tip first while standing directly behind the infeed

B. Butt end first while standing to the side of the infeed

C. Wearing loose clothing for rapid release if needed

D. Only during evening hours to avoid overheating

173. Aerial lift operators near energized lines must:

A. Approach within one foot for efficient pruning

B. Rely on rubber tires to isolate the lift electrically

C. Maintain distance only at the bucket itself

D. Maintain approach distance with both bucket and boom

174. Personal protective equipment should be inspected:

A. Before every use, with damaged items retired

B. Only during annual company safety reviews

C. Only after a known impact or failure event

D. Only by the original equipment manufacturer

175. The minimum tensile strength required for an arboricultural climbing rope under ANSI Z133 is approximately:

A. 1,800 pounds for residential climbing work

B. 3,000 pounds for routine maintenance work

C. 5,400 pounds per the current standard

D. 10,000 pounds for any climbing operation

176. A properly tied friction hitch should:

A. Lock rigidly and never move under any load

B. Grip reliably while permitting controlled adjustment

C. Be replaced after every single climb as standard practice

D. Slip continuously to allow rapid descent

177. The feed control bar on a wood chipper is designed to:

A. Stop the feed rollers in an emergency

B. Indicate the speed of the chipping drum

C. Meter lubricant to the feed roller bearings

D. Switch the chipper between forward and reverse

178. When refueling a chainsaw, the operator should:

A. Refuel quickly without removing the cap completely

B. Keep the saw running at low idle during refueling

C. Refuel with cut-resistant gloves still on the hands

D. Stop the saw and allow it to cool briefly first

179. A first aid kit on a tree care worksite should:

A. Be stored in a vehicle parked off the worksite

B. Contain only basic over-the-counter medications

C. Be available on site and stocked appropriately

D. Be carried only by the designated safety officer

180. Urban trees reduce the urban heat island effect primarily through:

A. Releasing methane gas into the atmosphere

B. Shading surfaces and evapotranspiration cooling

C. Absorbing heat directly through their root systems

D. Reflecting sunlight from waxy leaf surfaces

181. A complete tree inventory records information on:

A. Every tree within the defined inventory area

B. Only trees scheduled for immediate removal

C. Only a statistical sample of the total population

D. Only trees with obvious structural defects

182. The i-Tree suite of analytical tools was developed to help communities:

A. Identify unknown tree species from photographs

B. Predict which specific trees will fail in storms

C. Determine the genetic makeup of urban forests

D. Estimate the dollar value of ecosystem services

183. The trunk formula method of plant appraisal is most appropriate when:

A. The tree has no visible defects of any kind

B. A replacement tree of identical size is available

C. The tree is too large to replace with nursery stock

D. The tree is a recently planted nursery specimen

184. A typical tree protection ordinance:

A. Bans all pruning by private property owners

B. Requires permits for removal of protected trees

C. Requires mandatory removal of mature trees over time

D. Applies only to trees planted by the city itself

185. Canopy cover goals for a community are typically expressed as:

A. The percentage of land area covered by canopy

B. The number of trees per square mile of city

C. The total leaf biomass produced annually

D. The average height of street trees in feet

186. A Tree City USA community must maintain a minimum forestry budget of approximately:

A. Ten dollars per capita annually

B. Fifty dollars per capita annually

C. One hundred dollars per capita annually

D. Two dollars per capita annually

187. Species rating in plant appraisal reflects:

A. The lumber value of the species at market today

B. The desirability and suitability in the local area

C. The exact calendar age of the tree being valued

D. The current height of the tree in feet at appraisal

188. Effective communication with property owners about tree work should use:

A. Highly technical jargon to display expertise

B. Pressure tactics to close the sale quickly

C. Plain language with respect for the owner's decisions

D. Refusal to provide any pricing estimate

189. Multiple studies have documented which social or health benefit of urban trees?

A. Improved mental health and reduced stress for residents

B. Increased crime rates in heavily wooded neighborhoods

C. Higher rates of asthma across all age groups

D. Reduced physical activity among nearby residents

190. An urban forester advocating for canopy expansion before a budget-focused council should emphasize:

A. The aesthetic preferences of the forestry staff

B. The personal favorite tree species of the mayor

C. The simplicity of installing artificial turf instead

D. The documented dollar value of ecosystem services

191. Street trees planted following the 10-20-30 rule:

A. Must include only native species from the region

B. Protect the community against catastrophic pest loss

C. Must all be very slow-growing species only

D. Must be purchased from a single approved supplier

192. Which statement about the 10-20-30 rule is correct?

A. It applies only to publicly owned street trees

B. It requires every tree to be at least 30 feet tall

C. It limits maximum percentages at species, genus, and family levels

D. It applies only to trees purchased from one supplier

193. An ideal soil has approximately what percentage of mineral solids and organic matter?

A. 25 percent of the total volume

B. 75 percent of the total volume

C. 90 percent of the total volume

D. 50 percent of the total volume

194. A community inventory should generally include all of the following for each tree EXCEPT:

A. The exact dollar value of the surrounding real estate

B. The tree species or cultivar if known

C. The size at time of inventory recording

D. The tree's general condition at inspection

195. A 24-inch DBH tree has a Critical Root Zone radius of approximately:

A. 48 feet from the trunk outward

B. 12 feet from the trunk outward

C. 24 feet from the trunk outward

D. 6 feet from the trunk outward

196. Removing no more than what percentage of live foliage in one pruning session is the general guideline for mature trees?

A. 25 to 30 percent of live foliage

B. 10 to 15 percent of live foliage

C. 40 to 50 percent of live foliage

D. 75 percent of live foliage

197. A tree requiring approximately 3 years of establishment after planting most likely had a trunk caliper at planting of:

A. Less than half an inch in diameter

B. Approximately 10 inches in diameter

C. Approximately 8 inches in diameter

D. Approximately 3 inches in diameter

198. Which statement about the minimum approach distance to energized distribution lines below 50 kV is correct?

A. It is 10 feet for unqualified workers

B. It is 3 feet for all workers under all conditions

C. It does not apply to boom trucks or aerial lifts

D. It applies only when the weather is dry

199. Which statement about hinge width in a standard felling cut is most accurate?

A. The hinge should be cut completely before the tree falls

B. The hinge should be approximately 10 percent of trunk diameter

C. The hinge should equal 50 percent of the trunk diameter

D. The hinge is unnecessary for softwood species

200. Which statement about post-construction tree monitoring is correct?

A. It is unnecessary if the tree looks healthy at one year

B. It should be discontinued after six months of observation

C. It should continue for at least three to five growing seasons

D. It should be performed only after visible symptoms develop

PRACTICE EXAM 10 — ANSWER KEY AND EXPLANATIONS

1. C — The vascular cambium is the actively dividing layer that produces new xylem inward and new phloem outward each year. It is the engine of secondary growth and the source of annual growth rings. Heartwood, bark, and conducting xylem all originate from or relate to this single productive tissue.

2. A — Xylem conducting cells are dead at functional maturity, forming hollow tubes that transport water through the tree without requiring metabolic energy. This design is elegant because no respiration is needed to maintain the pipework. Phloem and cambium, in contrast, must remain living.

3. B — 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. Loss of pore space through compaction is a common urban problem.

4. D — Respiration occurs continuously in every living cell, day and night, throughout the year. Unlike photosynthesis, it requires no light and happens in roots, stems, buds, and leaves alike. Stressed trees continue to deplete reserves through respiration even when photosynthesis has stopped.

5. C — Evaporation from leaf surfaces creates the tension that pulls water upward through xylem via the cohesion-tension mechanism. No metabolic energy is required from the tree itself. This is why stomatal closure during drought halts water movement entirely.

6. A — Phloem cells remain alive at maturity and transport sugars from sources (typically leaves) to sinks (roots, growing tips, storage tissues). Unlike xylem, phloem requires active cellular processes for sugar transport. This is the fundamental difference between the two vascular tissues.

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

8. B — Heartwood is composed entirely of dead cells with extractives (tannins, resins) deposited in the cell walls. It provides structural support and resists decay but no longer conducts water. Sapwood, by contrast, is the outer functional xylem.

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

10. C — Auxin produced at the shoot tip travels downward and suppresses the growth of lateral buds below. Removing the leader interrupts this suppression and releases lateral buds to grow. This hormone-driven mechanism is the biological basis for many pruning responses.

11. D — Reserves reach their lowest point in late spring when new leaves have emerged and matured but have not yet returned more sugar than the refoliation cost. Spring defoliation during this window is particularly devastating. Reserves rebuild through summer and peak in autumn.

12. B — Mycorrhizal fungi extend the absorbing surface of the root system by sending hyphae far into the surrounding soil. The tree supplies sugars; the fungus supplies access to water and nutrients from a larger volume. The partnership is essential for most tree species.

13. A — The cohesion-tension theory relies on hydrogen bonding between water molecules, which holds the column of water together as it is pulled upward by transpiration tension. This cohesive strength allows trees to lift water hundreds of feet without active pumping.

14. C — Closing stomata simultaneously reduces transpiration (water loss) and photosynthesis (because CO_2 can no longer enter). This trade-off between water conservation and carbon gain is the central constraint on tree function under heat or drought stress.

15. B — Stomata regulate gas exchange (CO_2 in, O_2 and water vapor out) but do not anchor the leaf blade. The petiole and vascular tissues provide attachment. Distinguishing structural attachment from physiological functions is essential.

16. D — A tree responding to wind sway develops greater trunk taper and reaction wood through cambial response to mechanical stress. Wind flexing stimulates the cambium to lay down stronger wood where bending stress is greatest. This is why naturally flexed trees develop better structure than rigidly staked ones.

17. A — A successfully compartmentalized wound shows new wood and callus tissue surrounding the original injury, indicating that the tree has walled off the damage and produced new growth at the perimeter. This is the visible evidence of effective CODIT response.

18. C — A girdled tree dies because phloem transport of sugars to the roots is interrupted. The roots gradually starve and lose function, followed by the rest of the tree. Xylem flow continues above the girdle until root failure cascades upward.

19. D — Respiration consumes sugars to release stored chemical energy, while photosynthesis produces sugars by capturing light energy. The two processes are opposite directions of the carbon cycle within the tree. Both can occur simultaneously in living tissues.

20. B — 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.

21. A — Red oaks have pointed leaf lobe tips ending in bristles, with acorns maturing over two growing seasons. White oaks have rounded lobes without bristles and acorns maturing in a single season. These differences are the primary distinction between the two groups.

22. C — 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.

23. D — Cultivar names are written in single quotation marks and are not italicized, while the genus and species are italicized. Cultivars differ from botanical varieties, which occur in wild populations. The international code of nomenclature specifies this typographic convention.

24. 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.

25. A — 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.

26. C — A tree with a mature height under 25 feet is appropriate for planting beneath a 30-foot distribution line, leaving safe clearance below the conductors. This is a direct application of Right Tree, Right Place. Mature size, not planting size, governs the decision.

27. B — Oak, hickory, and beech all have alternate leaf arrangement on their stems. The MAD Horse genera (maple, ash, dogwood, horse chestnut) are opposite, as are catalpa and viburnum. Recognizing alternate vs. opposite narrows identification quickly.

28. D — 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.

29. 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. Mature size is particularly important. Ignoring mature dimensions is the most common species selection error.

30. C — American sycamore (*Platanus occidentalis*) is distinguished by mottled tan and gray peeling bark and broad palmate leaves. The bark alone often allows identification from a distance. Maples and hickories have very different bark patterns.

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

32. B — Winter identification depends on bud shape, twig features, and bark character because foliage is absent. These features are reliable enough for confident identification. Experienced arborists can identify most deciduous trees from twigs alone.

33. C — Native species are co-adapted to local climate, soils, pest pressures, and ecological relationships through evolutionary history. This adaptation is the genuine advantage. Claims of automatic pest immunity or guaranteed faster growth are overstatements.

34. A — The pH scale runs from 0 to 14, with 7 being neutral. Values above 7 are alkaline; values below 7 are acidic. Each whole number represents a tenfold change in hydrogen ion concentration.

35. D — 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.

36. B — Cation exchange capacity primarily depends on clay content and organic matter, both of which have negatively charged surfaces that hold cation nutrients. Building organic matter is the only practical way to raise CEC in sandy soils. Higher CEC means better nutrient retention.

37. 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.

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

39. B — Drain time of 36 hours indicates inadequate drainage for most tree species. Water that persists more than 12 to 24 hours signals a drainage problem. Site modification or species selection is required before planting.

40. D — Soil texture is essentially permanent because the proportions of sand, silt, and clay cannot be meaningfully altered by any realistic amount of amendment. These proportions are determined by parent material and weathering. Working with existing texture is the only realistic strategy.

41. B — Bulk density above approximately 1.7 g/cm³ indicates severe compaction that halts most root growth. A reading of 1.8 is clearly in the severe range. Values below 1.3 generally indicate good structure.

42. A — Maintaining a continuous organic mulch layer at the soil surface is the most effective long-term practice for building organic matter. Mulch decomposes gradually, enriching the soil without disturbance. Tilling damages existing roots and structure.

43. D — A composite sample averages variation across the area being tested, producing a representative result. A single spot sample may not reflect overall conditions. Proper sampling is the most important step in soil testing — more important than the analysis itself.

44. C — Mulching conserves moisture in the root zone, moderates soil temperatures, and suppresses competing weeds. It does not supply all of a tree's nitrogen needs, though decomposition contributes some. These three benefits are the reason mulching is universally recommended.

45. B — Iron chlorosis in a 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.

46. A — 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.

47. D — 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.

48. 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.

49. A — A widely used rule of thumb is one year of establishment per inch of trunk caliper at planting. A 2-inch caliper tree needs about two growing seasons; a 4-inch caliper tree needs about four. During this period the tree is rebuilding its root system.

50. B — 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.

51. 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 the tree is backfilled.

52. 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.

53. B — Planting too deep — burying the root flare — is the most common serious error in planting container-grown trees. The buried flare develops bark decay and girdling root problems that can take years to manifest. Finding and preserving the true flare is essential.

54. A — 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.

55. C — 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.

56. 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.

57. 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.

58. 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.

59. C — 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.

60. D — Mulching does not supply all of a tree's nitrogen needs for the year, though it may contribute some nitrogen as it decomposes. Mulching does conserve moisture, moderate temperature, and suppress weeds. The other three benefits are genuine.

61. A — Planting hole depth should equal the distance from the root flare to the bottom of the root ball — no deeper. A deeper hole allows the tree to settle and bury the root flare, producing long-term decline. Width can be generous, but depth must be exact.

62. D — Nursery stock should be inspected at delivery for trunk condition, crown structure, visible root flare, and root ball condition. Defects identified at delivery can be avoided by rejecting the tree. Inspection is more than checking the manifest.

63. B — A tree that fails to leaf out the spring after planting most likely suffered root ball desiccation during handling. Damaged or dried-out roots cannot support bud break. Inspection at delivery and proper handling prevent most of these failures.

64. C — ANSI A300 governs tree pruning and maintenance practices in the United States. ANSI Z133 addresses worker safety; ANSI Z60.1 covers nursery stock; ANSI Z89.1 covers head protection. Together these standards define accepted professional practice.

65. A — 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.

66. D — 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.

67. C — 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.

68. B — The first cut is made on the underside of the branch, partway through, several inches beyond the final cut location. This undercut prevents bark tearing when the second cut releases the branch. The sequence is non-negotiable for branches heavy enough to tear bark.

69. 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.

70. D — 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.

71. C — 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. Waiting until maturity is far less effective.

72. 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.

73. A — 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.

74. D — 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.

75. C — Pollarding requires 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.

76. 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.

77. D — 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.

78. A — 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.

79. C — 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.

80. B — 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.

81. A — 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.

82. C — Bypass blades cut with a scissor-like action between two curved blades, producing clean cuts on living wood without crushing tissue. Anvil blades press the stem against a flat surface and tend to crush, limiting them to dead material.

83. D — 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. Whole-tree felling and full-canopy work require different tools.

84. B — 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 thinning of that magnitude violates accepted standards and propose an appropriate alternative.

85. A — 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.

86. C — The raise objective refers to selective removal of lower branches to provide vertical clearance beneath the crown for pedestrians, vehicles, or sight lines. Raising should be done gradually on young trees to avoid producing a disproportionate crown.

87. B — 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.

88. D — 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.

89. A — 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.

90. C — 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.

91. D — 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.

92. B — 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.

93. A — 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.

94. C — A symptom is 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.

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

96. B — 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.

97. C — 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 when chemical control is warranted.

98. A — 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.

99. 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.

100. B — Iron is an immobile nutrient, and deficiency appears first on new leaves as interveinal chlorosis with green veins. The tree cannot translocate iron from older foliage. In landscape settings, this is almost always a pH-related availability problem.

101. A — 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.

102. D — 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.

103. C — 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.

104. 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. Sycamore anthracnose is a particularly visible example.

105. 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.

106. D — 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.

107. 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.

108. C — "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.

109. 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.

110. D — 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.

111. B — 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.

112. C — 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.

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

114. A — Directional boring or tunneling 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.

115. C — 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.

116. 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.

117. A — An arborist supervising unavoidable root impacts should make clean cuts with sharp tools at the damage line before excavation begins. Clean cuts produce better wound responses than the tearing and crushing from unprepared excavation.

118. D — 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.

119. 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.

120. C — 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.

121. D — 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.

122. A — 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.

123. C — 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.

124. B — 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.

125. D — A tree showing no visible symptoms one year after construction is not yet out of danger, because delayed decline can appear one to three years later as reserves are exhausted. Monitoring should continue for at least three to five growing seasons.

126. 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.

127. B — 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, including trunk and lower branches.

128. C — 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.

129. D — 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.

130. A — 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.

131. C — 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.

132. B — 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.

133. A — 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.

134. D — 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.

135. C — 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.

136. B — 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.

137. D — 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.

138. A — 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.

139. C — 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.

140. B — 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.

141. A — 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.

142. 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.

143. 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.

144. C — 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.

145. 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.

146. D — 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.

147. C — 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.

148. B — 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 other options are all genuine defects.

149. 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.

150. D — ANSI Z133 is the American National Standard for Arboricultural Operations — Safety Requirements and is the principal safety standard for tree care work in the United States. ANSI A300 addresses pruning; Z133 addresses safety.

151. 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.

152. C — 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.

153. A — 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.

154. D — 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.

155. 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.

156. C — 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.

157. D — 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.

158. A — 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.

159. B — 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.

160. C — 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.

161. D — 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.

162. 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.

163. 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.

164. C — 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.

165. D — 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.

166. A — 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.

167. C — 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.

168. 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.

169. D — 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.

170. A — 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.

171. C — 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.

172. B — 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.

173. D — 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.

174. A — 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.

175. C — 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.

176. 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.

177. A — 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.

178. D — 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.

179. C — 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.

180. 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.

181. 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.

182. D — 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.

183. C — 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.

184. B — 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.

185. A — 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 to the public.

186. D — 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.

187. B — 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.

188. C — 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.

189. 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.

190. D — 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.

191. 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.

192. C — 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. This hierarchy protects against threats at each taxonomic level. Diversity at all three levels matters.

193. D — An ideal soil contains approximately 50% mineral solids and organic matter combined, with the other 50% as pore space split between water and air. This balance supports root growth, water retention, and gas exchange. Loss of pore space through compaction disrupts the balance.

194. A — A tree inventory records species, size, condition, location, and management needs — but not the dollar value of surrounding real estate. Inventory focuses on tree attributes, not property economics. Real estate value is a separate consideration.

195. C — A 24-inch DBH tree has a CRZ radius of 24 feet, calculated as one foot per inch of trunk diameter at breast height. This formula is the standard reference in ISA Best Management Practices. It produces a more defensible boundary than the dripline.

196. 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.

197. D — A widely used rule of thumb is one year of establishment per inch of trunk caliper at planting. A tree requiring approximately 3 years of establishment would have been planted at about 3 inches of caliper. Larger-caliper trees take proportionally longer.

198. A — The minimum approach distance for unqualified workers to energized distribution lines below 50 kV is 10 feet under ANSI Z133. This figure applies regardless of weather, tree, or equipment. Boom trucks and lifts must maintain the same distance.

199. B — The hinge in a standard felling cut should be approximately 10% of trunk diameter. Cutting the hinge too thin causes loss of fall direction control and can produce a barber chair. The hinge must remain intact until the tree has committed to falling.

200. C — Post-construction monitoring should continue for at least three to five growing seasons because delayed decline can appear one to three years later as reserves are exhausted. A tree that looks healthy at one year may still decline. Patience drives recovery.