PRACTICE EXAM 9: ISA CERTIFIED ARBORIST SIMULATION

PRACTICE EXAM 9 — QUESTIONS 1–200

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

1. A tree shows both adequate soil moisture and wilting foliage on a cool morning. The most likely explanation is:

A. Normal phototropic response to sunrise

B. Excess root respiration during cool weather

C. A damaged root system unable to absorb available water

D. Stomatal failure from chlorophyll breakdown

2. A wound on a mature oak shows a thin rim of new wood and callus closing over the original injury. This indicates that the cambium has formed:

A. Wall 4, the strongest CODIT barrier

B. Wall 1, resisting vertical decay spread

C. Wall 2, resisting inward decay spread

D. Wall 3, resisting lateral decay spread

3. A young tree planted in a windy site and never staked develops greater trunk taper than a sheltered tree of the same age. The greater taper reflects:

A. Increased phloem production from extra sunlight

B. Reaction wood produced in response to flexing

C. Faster nitrogen uptake on exposed sites

D. Reduced competition from neighboring plants

4. Photosynthesis stops in a tree when stomata close, primarily because:

A. Sunlight cannot reach the inner leaf cells

B. Chlorophyll degrades during stomatal closure

C. Water transport through xylem halts immediately

D. Carbon dioxide can no longer enter the leaf

5. A tree girdled in midsummer typically shows above-ground decline:

A. Within hours of the girdling event

B. Months to a few years later as roots fail

C. Only during the next dormant season

D. Immediately on the affected side of the trunk

6. A tree's stored carbohydrate reserves and its risk of dying from stress are linked because:

A. Reserves fuel recovery from defoliation, drought, and wounds

B. Reserves replace damaged xylem cells immediately

C. Reserves prevent any cavitation during drought events

D. Reserves directly absorb water from the surrounding soil

7. A tree wound that fails to compartmentalize is most likely a sign of:

A. Excellent overall tree vigor

B. Recent fertilization with nitrogen

C. Increased mycorrhizal activity at the root flare

D. Poor cambial vigor and exhausted reserves

8. The combination of opposite leaf arrangement and paired winged samaras most reliably indicates which genus?

A. *Quercus*, the oak genus

B. *Fraxinus*, the ash genus

C. *Acer*, the maple genus

D. *Pinus*, the pine genus

9. A tree with alternate simple leaves, rounded lobes, and acorns maturing in a single season belongs to:

A. The white oak group of *Quercus*

B. The red oak group of *Quercus*

C. The maple genus *Acer*

D. The hickory genus *Carya*

10. A tree species described as both non-native and ecologically harmful in a region is best termed:

A. Exotic and ornamental

B. Invasive and naturalized in the area

C. Endemic and threatened by clearing

D. Native and fast-growing in disturbed sites

11. Identifying a deciduous tree in winter typically requires the use of:

A. Leaf color and venation of new spring foliage

B. Flower fragrance from the previous year

C. Root flare width measured at soil level

D. Bud shape, twig features, and bark character

12. The 10-20-30 rule sets diversity limits to protect against catastrophic pest loss at the levels of:

A. Order, family, and genus

B. Cultivar, species, and genus

C. Species, genus, and family

D. Genus, family, and order

13. A subdivision needing a tree under 25 feet tall beneath a 30-foot distribution line should select:

A. A flowering crabapple reaching about 20 feet

B. A pin oak reaching about 60 feet

C. A tulip poplar reaching about 80 feet

D. A red oak reaching about 70 feet

14. The cultivar designation "'October Glory'" following the species name *Acer rubrum* is correctly written as:

A. ACER RUBRUM "OCTOBER GLORY"

B. *Acer rubrum* 'October Glory'

C. *Acer Rubrum* 'October glory'

D. acer rubrum (october glory)

15. A native species generally provides which ecological advantage over a non-native?

A. Automatic immunity from local pests and diseases

B. Faster growth than every introduced alternative

C. Lower mature height than imported species

D. Co-evolution with local ecological communities

16. The MAD Horse mnemonic identifies temperate genera with:

A. Opposite leaf arrangement on the stems

B. Compound leaves with five or more leaflets

C. Distinctive papery peeling bark

D. Cones rather than flowers as fruits

17. A pinnately compound leaf is distinguished from a simple lobed leaf by:

A. The color of its veins under the leaf

B. The presence of a single bud at each lobe

C. The presence of fully separated leaflets along a rachis

D. The angle between the leaf and the parent stem

18. *Fraxinus* (the ash genus) belongs to which plant family?

A. Pinaceae, the pine family

B. Oleaceae, the olive family

C. Sapindaceae, the soapberry family

D. Fagaceae, the beech family

19. Tree of heaven (*Ailanthus altissima*) is widely classified in eastern North America as:

A. A native climax forest species

B. A native flowering ornamental

C. A short-lived nursery cultivar

D. A non-native invasive species

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

A. American sycamore in the plane family

B. Sugar maple in the soapberry family

C. Norway maple introduced from Europe

D. Shagbark hickory in the walnut family

21. A soil with roughly balanced sand, silt, and clay proportions and good organic matter content is best classified as:

A. Sandy clay with restricted drainage

B. Silty clay with poor structural stability

C. Loam, an ideal texture for most species

D. Clay loam dominated by fine particles

22. The pH scale used to describe soil chemistry runs from:

A. 0 to 7 with neutral at zero

B. 0 to 14 with neutral at seven

C. 1 to 10 with neutral at five

D. 0 to 20 with neutral at ten

23. A pin oak in a soil with pH 7.8 develops interveinal chlorosis on its newest leaves. The most likely explanation is:

A. A nitrogen deficiency from lawn competition

B. Excess potassium suppressing magnesium

C. Sulfur excess from a nearby industrial source

D. High soil pH rendering iron chemically unavailable

24. A composite soil sample produces more reliable results than a single grab sample because it:

A. Averages variation across the sampled area

B. Eliminates the need for any laboratory work

C. Costs much less for the laboratory to run

D. Requires no specialized sampling equipment

25. Compaction harms tree roots primarily because it:

A. Concentrates salts at lethal levels

B. Raises soil temperatures excessively

C. Reduces pore space and root oxygen

D. Increases soil acidity in the root zone

26. A bulk density of 1.8 g/cm³ in a mineral soil indicates:

A. Loose structure supporting healthy roots

B. The optimal range for root expansion

C. A reading typical of forest topsoil

D. Severe compaction halting most root growth

27. A perc test that shows water taking 36 hours to drain indicates:

A. Drainage inadequate for most tree species

B. Drainage ideal for any species available

C. Excessive drainage that will dry out roots

D. The soil is permanently waterlogged below

28. The most effective long-term way to improve organic matter in a landscape soil is to:

A. Till the soil deeply each spring season

B. Apply fine sand annually to the surface

C. Maintain a continuous organic mulch layer

D. Spray hydrogen peroxide on the soil

29. Mycorrhizal fungi benefit a host tree primarily by:

A. Producing antibiotics that kill all soil pathogens

B. Extending the absorbing surface of the roots

C. Storing surplus carbohydrates for the tree

D. Fixing atmospheric nitrogen in tissues

30. Continuous addition of organic matter improves a clay soil over time primarily by:

A. Improving aggregation and pore space

B. Lowering the soil pH to acidic conditions

C. Increasing the proportion of sand particles

D. Eliminating clay particles entirely

31. Cation exchange capacity (CEC) is most strongly influenced by:

A. The depth of the topsoil horizon

B. The annual rainfall received at the site

C. The temperature of the soil through the year

D. Clay content and organic matter present

32. A proper mulch layer around a landscape tree should be:

A. Six to eight inches deep against the trunk

B. Two to four inches deep with the trunk clear

C. A thin scattering across the entire lawn

D. Replaced with plastic sheeting for moisture

33. Soil texture is essentially permanent because:

A. Microbes restore the original texture quickly

B. Organic matter regenerates the original texture

C. Sand, silt, and clay proportions cannot be altered

D. Laboratory testing rarely identifies real changes

34. An ideal mineral soil contains approximately what percentage of pore space?

A. About 50 percent split between water and air

B. About 25 percent mostly filled with water

C. About 10 percent with the rest as solids

D. About 75 percent mostly filled with air

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

A. Iron, an immobile micronutrient

B. Calcium, a structural secondary nutrient

C. Boron, a trace element for cell division

D. Nitrogen, a mobile macronutrient

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

A. Exactly the diameter of the root ball

B. Two to three times the root ball diameter

C. Half the diameter of the root ball

D. Ten times the diameter of the ball

37. A newly planted tree's root flare should be set:

A. Six inches below the surrounding grade

B. Twelve inches below the lawn surface

C. At or slightly above the surrounding grade

D. Completely buried beneath several inches of mulch

38. Backfill for a planting hole should generally consist of:

A. The native soil excavated from the hole

B. Sterilized purchased potting mix only

C. Equal parts peat moss and perlite mixed

D. Coarse builder's sand with added lime

39. A newly planted tree typically requires approximately one year of establishment per:

A. Foot of mature height the species reaches

B. Square foot of crown spread at planting

C. Inch of branch diameter on scaffold limbs

D. Inch of trunk caliper at the time of planting

40. Staking a newly planted tree should generally be:

A. Permanent for the entire life of the tree

B. Used only when needed and removed within a year

C. Required on every newly planted specimen

D. Tightened progressively as the tree grows

41. A circling root found inside a container at planting should be:

A. Left intact to avoid damaging fine tips

B. Cut or straightened before placing in the hole

C. Coated with rooting hormone before backfilling

D. Treated with a commercial wound dressing

42. Wire baskets on B&B trees should generally be:

A. Left completely intact to support the root ball

B. Removed entirely before lowering into the hole

C. Replaced with plastic mesh for biodegradability

D. Cut and removed at least from the upper portion

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

A. Setting the root ball too deep with a buried flare

B. Watering too lightly during the first week

C. Failing to install stakes on all sides

D. Using only native soil as the backfill material

44. Watering a newly planted tree should aim to keep the root ball:

A. Saturated continuously for the first month

B. Completely dry to encourage deep rooting

C. Consistently moist but not saturated

D. Moist only on the south-facing side

45. Fertilization of a newly planted tree during its first growing season is generally:

A. Required by most municipal specifications

B. Best applied as a foliar spray to leaves

C. The most important practice for survival

D. Unnecessary and sometimes counterproductive

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

A. Mid-summer during peak active growth

B. Dormancy in late fall or early spring

C. Immediately after leaf expansion in spring

D. Any month with adequate irrigation available

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

A. Encourage new fibrous roots inside the future ball

B. Reduce the total weight of the future ball

C. Eliminate any future need for irrigation

D. Prevent suckers from emerging at the trunk

48. Twine tied around the trunk of a B&B tree should be:

A. Tightened further for additional stability

B. Replaced with heavier cord before planting

C. Removed completely to prevent future girdling

D. Left in place because it decomposes quickly

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

A. Grasping the trunk firmly with two hands

B. Supporting the root ball from underneath

C. Wrapping the crown with lifting straps

D. Pulling on the burlap from the very top

50. Mulching a newly planted tree provides all of the following benefits EXCEPT:

A. Conserving moisture in the root zone

B. Moderating soil temperatures over time

C. Suppressing competing weeds at the trunk

D. Supplying all the tree's nitrogen needs

51. The depth of a planting hole should:

A. Equal the height from root flare to ball bottom

B. Be at least twice the height of the root ball

C. Reach below the tree's lowest scaffold branches

D. Include a layer of gravel for drainage below

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

A. The brand name printed on the container

B. The exact weight printed on the manifest

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

D. The width of the wire basket only

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

A. Inadequate mulch depth at the trunk

B. Root ball desiccation during handling

C. A foliar disease attacking the expanding buds

D. Cold temperatures during the dormant period

54. ANSI A300 governs which area of professional tree work?

A. Worker safety on arboricultural job sites

B. Quality standards for nursery stock production

C. Helmet and head protection specifications

D. Tree pruning and maintenance practices

55. A correct pruning cut is placed:

A. Just outside the branch collar and bark ridge

B. Flush with the parent stem for smoothness

C. Six inches beyond the branch collar

D. At the midpoint of the branch length

56. Topping a mature shade tree is unacceptable primarily because it:

A. Requires specialty equipment most crews lack

B. Cannot be performed without damaging utilities

C. Creates large wounds, depletes reserves, and produces weak sprouts

D. Is permitted only under specific safety standards

57. The three-cut method of branch removal is used primarily to:

A. Reduce sawdust accumulation on the worksite

B. Prevent bark from tearing down the trunk

C. Speed up the total cutting time per branch

D. Allow the use of a smaller chainsaw bar

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

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

B. From above at the exact final cut location

C. Straight down through the top of the branch

D. Parallel to the trunk to score the bark

59. The cleaning pruning objective involves selective removal of:

A. All interior live foliage to thin the crown

B. Every lateral branch crossing another branch

C. The outermost six inches of every branch

D. Dead, dying, diseased, broken, or weak branches

60. A reduction cut differs from a heading cut in that a reduction cut:

A. Is always made with hand pruners only

B. Cuts back to a lateral that can assume the role

C. Removes only branches under one inch

D. Leaves an arbitrary stub regardless of laterals

61. 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

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

A. 10 to 15 percent, less for stressed specimens

B. 25 to 30 percent during active growth

C. 40 to 50 percent in the dormant season

D. There is no upper limit for healthy mature trees

63. The branch bark ridge is best described as:

A. An internal barrier inside the heartwood

B. A layer of dead bark separating heartwood from sapwood

C. The outer protective layer covering the trunk surface

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

64. Lion-tailing is a harmful pruning practice in which:

A. Only deadwood is removed from the canopy

B. Interior foliage is stripped, concentrating weight at branch ends

C. The central leader is severed at the trunk

D. Every crossing branch is removed at its base

65. Pollarding is a traditional pruning technique that requires:

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

B. Removal of the central leader during establishment

C. Annual application of wound dressing on cuts

D. Complete heading back of the entire canopy

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

A. Recently planted in their establishment phase

B. Selected for removal at project completion

C. Topped, vandalized, or severely storm damaged

D. Designated as historic specimens by ordinance

67. Wound dressings applied to pruning cuts have been shown by research to:

A. Eliminate any risk of decay organisms entering

B. Accelerate compartmentalization across all species

C. Be required by the current ANSI A300 standard

D. Provide minimal benefit and sometimes slow healing

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

A. Warm summer months to speed wound closure

B. Dormancy to reduce disease transmission risk

C. Wet rainy days when beetles are inactive

D. Any time of year with sterilized tools

69. Subordination pruning is used to:

A. Reduce the growth of a competing stem in favor of a leader

B. Eliminate the central leader entirely

C. Remove all epicormic sprouts from the trunk

D. Cut every lateral branch to equal lengths

70. A flush cut damages a tree because it:

A. Uses excessive force from the cutting tool

B. Leaves a projecting stub beyond the collar

C. Removes the branch collar and Wall 4 tissue

D. Allows excess rainwater to enter the wound

71. A stub cut leaves dead wood projecting beyond the collar, which:

A. Stores reserves for future epicormic sprouts

B. Adds useful structural weight to the branch

C. Helps birds nest more securely on the trunk

D. Cannot be compartmentalized and invites decay

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

A. Cut cleanly without crushing the stem

B. Apply more force at a lower cutting angle

C. Can be sharpened without removing them

D. Are lighter and reduce operator fatigue

73. A pole pruner is most appropriate for:

A. Branches over six inches in diameter overhead

B. Small branches out of reach without climbing

C. Felling small trees on flat terrain only

D. Cutting all lower branches on mature trees

74. An arborist asked to thin a mature tree by 50 percent should:

A. Remove only the smallest interior branches

B. Comply using exclusively bypass hand pruners

C. Agree but charge double for the additional work

D. Explain that thinning of that magnitude violates accepted standards

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

A. By spraying the union with systemic fungicide

B. By removing the tree as a preventive measure

C. Early, while stems and necessary cuts are small

D. After the tree reaches structural maturity

76. The raise pruning objective refers to:

A. Removing lower branches for vertical clearance

B. Increasing the overall height of the crown

C. Lifting the tree with mechanical equipment

D. Raising the soil grade around the trunk

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

A. Working on healthy trees during dormant season

B. Pruning trees affected by contagious diseases

C. Performing routine pruning of any healthy tree

D. Using bypass hand pruners on small twigs

78. A professional pruning specification should include all of the following EXCEPT:

A. The identified pruning objective

B. The percentage of live foliage to remove

C. The diameter range of cuts to be made

D. The climber's personal preferences

79. Bypass loppers are most appropriate for branches:

A. Smaller than one-quarter inch in diameter

B. Larger than four inches in diameter

C. Up to one and a half to two inches in diameter

D. Of any size encountered during ground work

80. Removing a dead branch from a mature tree falls under which pruning objective?

A. Reduce to lower the overall crown height

B. Clean to remove dead and weak branches

C. Restore after previous storm damage

D. Raise to provide pedestrian clearance

81. 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 placement of the cut relative to the branch collar

D. The time of day when the cut was made

82. The first step in diagnosing an unhealthy tree should be to:

A. Identify the species and its normal characteristics

B. Apply broad-spectrum fungicide as a precaution

C. Recommend immediate removal of the tree

D. Collect samples for laboratory analysis

83. A "sign" of a tree disease is best defined as:

A. A description written in the inspection report

B. The tree's general response such as wilting

C. A homeowner's complaint about leaf appearance

D. Direct evidence of the causal agent itself

84. A "symptom" of a tree disorder refers to:

A. A visible fruiting body of a fungal pathogen

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

C. A nest of active wood-boring insects on the trunk

D. Laboratory confirmation of a specific pathogen

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

A. Can kill healthy vigorous trees on its own

B. Cannot reproduce except under drought stress

C. Is found only in remote forested areas

D. Attacks only trees that are already weakened

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

A. Was introduced earlier than other borers

B. Reproduces only under drought conditions

C. Requires bark wounds to enter the tree

D. Successfully attacks healthy ash trees of all sizes

87. Integrated Pest Management is best understood as:

A. A specific brand of organic pesticide

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

C. A complete prohibition on all chemical control

D. A method limited only to biological agents

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

A. Pinaceae including pines and firs

B. Sapindaceae including maples

C. Rosaceae including apples and pears

D. Fagaceae including oaks and beeches

89. Oak wilt is spread from tree to tree primarily by:

A. Root grafts and sap-feeding beetles

B. Wind dispersing spores across forests

C. Soil nematodes feeding on fine roots

D. Rain splashing from infected leaves

90. A tree with interveinal chlorosis on new leaves while older leaves remain green most likely has:

A. Nitrogen deficiency affecting mobile nutrients

B. Excess rainfall causing root rot damage

C. Calcium toxicity from previous over-liming

D. Iron deficiency, often related to high soil pH

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

A. An active spider mite outbreak in the canopy

B. Phenoxy herbicide drift or residual exposure

C. Normal seasonal fall color development

D. Drought stress during a dry period

92. 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

C. Root damage during construction now exhausting reserves

D. Reduced rainfall during the dormant period

93. Anthracnose is best classified as a:

A. Fungal disease producing leaf spots and blotches

B. Bacterial infection of the vascular system

C. Viral disease transmitted by aphid vectors

D. Nutrient disorder limited to new growth

94. Armillaria root rot is confirmed by finding:

A. Orange pustules on the upper surface of leaves

B. Sticky honeydew dripping from twig tips

C. Hollow tunnels carved into the heartwood

D. White mycelial sheets beneath the bark of infected roots

95. Dutch elm disease is spread primarily by:

A. Soil nematodes feeding on elm root systems

B. Elm bark beetles and root grafts between trees

C. Wind blowing spores across long distances

D. Rain splash from infected foliage to others

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

A. High-value trees threatened by borers

B. Small seedlings growing in container nurseries

C. Very young trees during establishment

D. Controlling weeds in the surrounding lawn

97. The phrase "the label is the law" means pesticide labels are:

A. Advisory documents to be followed when convenient

B. Expired after one year of open storage

C. Legally enforceable federal documents

D. Binding only during the first application

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

A. Apply experimental treatments without informing the owner

B. Recommend removing all nearby trees as a precaution

C. Refuse to discuss the finding with the property owner

D. Communicate honestly and recommend appropriate management

99. A tree wilting despite adequate soil moisture most likely has:

A. Normal seasonal afternoon stress

B. A damaged root system unable to absorb the available water

C. A foliar disease mimicking water stress

D. An overabundance of mycorrhizal colonization

100. A primary pest differs from a secondary pest in that the primary pest:

A. Must wait for tree stress before attacking

B. Is found only in natural forest habitats

C. Can attack and kill healthy vigorous trees on its own

D. Reproduces only after a tree has died

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

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

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

C. Three feet per inch of trunk diameter

D. Six inches per inch of trunk diameter

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

A. The trunk itself, encircling the bark closely

B. The dripline regardless of tree size or species

C. Half the distance between trunk and dripline

D. The CRZ boundary or further from the trunk

103. Concrete washout within a Tree Protection Zone is harmful because:

A. The aggregate physically damages absorbing roots

B. The high pH of the washwater can sterilize soil

C. The vibration disturbs fine root hairs

D. The cement sets up around root surfaces

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

A. Immediate death within days of the work

B. Improved drainage benefits across the root zone

C. Gradual decline as roots lose access to oxygen

D. Stronger anchorage during major storms

105. The least damaging method for installing a utility line across a 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

106. Storage of construction materials within a Tree Protection Zone is:

A. Permitted if the materials are lightweight only

B. Required to free up other staging areas

C. Allowed only during dry weather conditions

D. Prohibited because of soil compaction and root damage

107. A pre-construction tree assessment ideally occurs:

A. After demolition has begun on the site

B. After foundations have been poured and graded

C. Before final design so findings can influence decisions

D. Only if trees show obvious symptoms later

108. An arborist supervising unavoidable root impacts should:

A. Allow the excavator to tear roots randomly

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

C. Wait until after excavation to assess damage

D. Apply wound sealant to every cut root surface

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

A. Aggressive crown reduction to balance roots

B. Heavy nitrogen fertilization to force growth

C. Immediate trunk injection with systemic fungicide

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

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

A. Actual root systems extend well beyond the dripline

B. Drip patterns change shape during different seasons

C. Drip lines cannot be enforced legally

D. Drip lines are too difficult to survey accurately

111. 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

112. Tree protection fencing on a construction site should be:

A. Lightweight flagging tape that crews can move freely

B. Sturdy, visible, clearly marked, and maintained throughout

C. Short stakes spaced widely apart for appearance

D. Painted to match nearby buildings on the lot

113. 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

114. 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. Better wind anchorage from remaining roots

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

115. A baseline tree condition report prepared before construction:

A. Eliminates any need for later monitoring

B. Documents pre-existing conditions for later comparison

C. Is used exclusively for billing the client

D. Satisfies all regulatory requirements automatically

116. 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. Should still be monitored for delayed decline

D. Can be safely fertilized heavily without concern

117. 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

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

A. Approached immediately for pruning by any worker

B. Sprayed with water to dissipate the electrical charge

C. Removed quickly before the contact is reported

D. Treated as potentially energized until the utility confirms otherwise

119. In formal tree risk assessment, "risk" is defined as:

A. The presence of any visible defect on a mature tree

B. The age of the tree multiplied by its height

C. The combination of likelihood of failure and severity of consequences

D. The total monetary value of the tree at market

120. A Level 2 tree risk assessment is typically:

A. A laboratory analysis of collected wood cores

B. A detailed visual inspection of an individual tree

C. A rapid drive-by screening of street trees

D. A theoretical model based on species alone

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

A. Detailed evaluation of a single specimen of concern

B. Advanced internal diagnostics with instruments

C. Rapid screening of large tree populations

D. Post-incident investigation of failure events

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

A. Prevents formation of a strong structural union

B. Emits chemical signals that attract decay

C. Acts as a reservoir for boring insect larvae

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

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

A. A healthy mycorrhizal partnership beneath the bark

B. Normal seasonal shedding of outer bark layers

C. Excess nitrogen from recent fertilization

D. Active decay already established within the tree

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

A. A specific branch identified for pruning removal

B. Any person, property, or activity that could be affected by failure

C. A zone where the tree is expected to fall

D. An area of decay that has become externally visible

125. Target occupancy rate refers to:

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

B. The age of structures beneath the canopy

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

D. The total value of nearby real estate

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

A. Root plate movement and elevated uprooting risk

B. Normal phototropic adjustment toward sunlight

C. A cosmetic change without structural meaning

D. Seasonal soil movement unrelated to the tree

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

A. Measuring nitrogen content of the trunk wood

B. Identifying the species from the sound alone

C. Locating overwintering insects in the bark

D. Detecting hollow areas through changes in sound

128. The TRAQ risk matrix combines which two dimensions?

A. Tree species and trunk diameter at breast height

B. Likelihood of failure and impact with consequences

C. Site drainage and measured soil pH

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

129. 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 imminent

C. Failure is unlikely but not impossible

D. Failure cannot occur under any conditions

130. 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

C. Catastrophic damage, serious injury, or death

D. No measurable effect on any nearby targets

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

A. The cavity drains rainwater quickly after storms

B. The cavity is smaller than four inches in width

C. The cavity is located above six feet from grade

D. Sufficient intact wood remains around the perimeter

132. 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 part

C. Only the distance between tree and structure

D. Only the calendar age of the tree at failure

133. Residual risk refers to:

A. The cost of insurance premiums on tree property

B. Risk during the mitigation work itself

C. Risk remaining after mitigation has been implemented

D. Risk visible only after a tree is removed

134. A professional risk assessment report should include:

A. Only a single sentence final risk rating

B. Scope, defects, targets, mitigation, and residual risk

C. The arborist's billing details for the visit

D. A removal recommendation for every tree examined

135. Level 3 risk assessment tools include:

A. Standard measuring tape and ground observation

B. Color photographs taken from a moving vehicle

C. Basic hand pruners and small mallet

D. Resistograph drilling and sonic tomography

136. Cabling and bracing systems installed on mature trees:

A. Reduce but do not eliminate structural risk

B. Eliminate all structural risk on the union completely

C. Are required on every mature tree by ANSI A300

D. Need no further inspection after installation

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

A. Use highly technical jargon to establish credibility

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

C. Recommend only the most expensive option

D. Withhold uncertain information to avoid worry

138. 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. Never produce any above-ground symptoms

D. Are below ground and not directly observable

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

A. A healthy rounded callus around an old small wound

B. A codominant stem with significant included bark

C. An active vertical crack exposing internal wood

D. A large dead scaffold limb above an occupied area

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

A. Removing the entire tree as a preventive measure

B. Ignoring the situation until the branch fails

C. Reduction pruning to decrease end weight

D. Cabling every branch in the entire crown

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

A. ANSI A300 covering pruning practices

B. ANSI Z133 covering arboricultural safety requirements

C. ANSI Z60.1 covering nursery stock

D. OSHA 29 CFR 1926 for general construction

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

A. Ten feet in any direction

B. Three feet in any direction

C. Five feet in any direction

D. Twenty-five feet in any direction

143. 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. Personal ownership of insulated rubber gloves

D. Specialized training in electrical hazards and line clearance

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

A. A wide brim for blocking direct sunlight

B. A chin strap to retain the helmet during climbing

C. An open face design for peripheral vision

D. Reflective tape covering every external surface

145. Chainsaw-resistant leg protection works by:

A. Activating an electromagnetic brake in the saw

B. Reflecting the moving chain away from skin

C. Containing fibers that clog the chain on contact

D. Producing an audible warning to the operator

146. Hearing protection is generally required when noise levels exceed:

A. 85 decibels of typical chainsaw operation

B. 30 decibels of normal conversation

C. 50 decibels of quiet outdoor activity

D. 120 decibels of extreme machinery use

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

A. Only the names of all crew members present

B. Only the lunch break schedule for the crew

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

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

148. 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. For essentially all climbing operations with a crew

D. Only on weekends and holidays when EMS is delayed

149. Suspension trauma can develop in a climber who:

A. Ascends a stationary line too quickly to the canopy

B. Remains motionless in a harness for an extended time

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

D. Switches between rope systems during a climb

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

A. The upper portion of the bar tip

B. The bottom edge of the bar near the powerhead

C. The middle of the cutting bar during use

D. The rear handle near the throttle control

151. 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. Prevent engine flooding during cold-weather starts

D. Stop the chain when activated by kickback or hand

152. The proper left-hand grip on a chainsaw includes:

A. Only fingertip contact for quick release

B. The thumb wrapped fully around the front handle

C. Loose contact to absorb engine vibration

D. Palm contact with thumb alongside the handle

153. Two-handed operation of a chainsaw is:

A. Required only for felling very large mature trees

B. Optional based on operator preference and skill

C. The standard practice for nearly all saw use

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

154. Top-handle chainsaws are designed specifically for:

A. Climbing arborist use up in the canopy

B. Cutting firewood at a residential woodlot

C. Bucking large logs while standing on the ground

D. Felling full-size mature trees in forestry

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

A. Sharpen the chain automatically during use

B. Lubricate the chain during long cuts

C. Secure the chain to the bar during transport

D. Catch the chain if it breaks during cutting

156. The working load limit of rigging equipment is approximately:

A. Half of the rated tensile strength

B. One-tenth of the rated tensile strength

C. Nine-tenths of the rated tensile strength

D. Equal to the rated tensile strength itself

157. Shock loading in rigging refers to:

A. The static weight of the largest piece handled

B. Initial lifting force applied to a cut piece

C. Dynamic forces from a falling piece suddenly caught

D. Electrical charge building up in a dry rope

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

A. Use a friction device to allow controlled slip

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

C. Use the smallest-diameter rope that will fit the load

D. Position the ground worker beneath the falling piece

159. A block redirecting a rigging load over an anchor experiences approximately:

A. Half the force of the load itself

B. Exactly the force of the load itself

C. No additional force when properly installed

D. Twice the force of the load itself

160. The hinge in a standard felling cut:

A. Must be cut completely through before the tree falls

B. Controls fall direction as the tree commits to falling

C. Is needed only for hollow or decayed trees

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

161. An escape route during felling operations should:

A. Lead directly beneath the falling tree

B. Be planned and cleared before cutting begins

C. Be improvised at the moment of the actual fall

D. Always be exactly straight behind the feller

162. "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. A specialty chain used for resinous softwood

D. Vertical splitting of the trunk during the back cut

163. Chipper operators should feed branches into the machine:

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

B. Tip first while standing directly behind the infeed

C. Wearing loose clothing for rapid release if needed

D. Only during evening hours to avoid overheating

164. 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 approach distance with both bucket and boom

D. Maintain distance only at the bucket itself

165. Personal protective equipment should be inspected:

A. Only during annual company safety reviews

B. Before every use, with damaged items retired

C. Only after a known impact or failure event

D. Only by the original equipment manufacturer

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

A. 1,800 pounds for residential climbing work

B. 3,000 pounds for routine maintenance work

C. 10,000 pounds for any climbing operation

D. 5,400 pounds per the current standard

167. A properly tied friction hitch should:

A. Grip reliably while permitting controlled adjustment

B. Lock rigidly and never move under any load

C. Be replaced after every single climb

D. Slip continuously to allow rapid descent

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

A. Indicate the speed of the chipping drum

B. Meter lubricant to the feed roller bearings

C. Stop the feed rollers in an emergency

D. Switch the chipper between forward and reverse

169. 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

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

A. Be stored in a vehicle parked off the site

B. Be available on site and stocked appropriately

C. Contain only basic over-the-counter medications

D. Be carried only by the designated safety officer

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

A. Shading surfaces and evapotranspiration cooling

B. Releasing methane gas into the atmosphere

C. Absorbing heat directly through their root systems

D. Reflecting sunlight from waxy leaf surfaces

172. A complete tree inventory records information on:

A. Only trees scheduled for immediate removal

B. A statistical sample of the total population

C. Only trees with obvious structural defects

D. Every tree within the defined inventory area

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

A. Identify unknown tree species from photographs

B. Estimate the dollar value of ecosystem services

C. Predict which specific trees will fail in storms

D. Determine the genetic makeup of urban forests

174. 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

175. A typical tree protection ordinance:

A. Requires permits for removal of protected trees

B. Bans all pruning by private property owners

C. Requires mandatory removal of mature trees over time

D. Applies only to trees planted by the city

176. Canopy cover goals are typically expressed as:

A. The number of trees per square mile of city

B. The total leaf biomass produced annually

C. The average height of street trees in feet

D. The percentage of land area covered by canopy

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

A. Ten dollars per capita annually

B. Fifty dollars per capita annually

C. Two dollars per capita annually

D. One hundred dollars per capita annually

178. Species rating in plant appraisal reflects:

A. The lumber value of the species today

B. The desirability and suitability in the local area

C. The exact age of the tree being appraised

D. The current height of the tree in feet

179. Communicating recommendations to a property owner should use:

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

B. Highly technical jargon to display expertise

C. Pressure tactics to close the sale quickly

D. Refusal to provide any pricing estimate

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

A. Increased crime rates in heavily wooded neighborhoods

B. Higher rates of asthma across all age groups

C. Reduced physical activity among nearby residents

D. Improved mental health and reduced stress for residents

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

A. The aesthetic preferences of the forestry staff

B. The documented dollar value of ecosystem services

C. The simplicity of installing artificial turf instead

D. The personal favorite tree species of the mayor

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

A. Must include only native species from the region

B. Must all be very slow-growing species only

C. Protect the community against catastrophic pest loss

D. Must be purchased from a single approved supplier

183. The combination of native habitat support and urban climate cooling makes the strongest case for:

A. Increased canopy cover in urban communities

B. Removal of all non-native species from cities

C. Avoiding any new tree planting in dense areas

D. Replacing trees with engineered shade structures

184. A complete tree inventory differs from a windshield survey in that the inventory:

A. Counts only trees with visible defects

B. Uses statistical sampling rather than full counts

C. Is completed only by city staff in vehicles

D. Records every tree within the defined area

185. The trunk formula appraisal method is preferred over the replacement cost method when:

A. The tree is small enough to be easily replaced

B. The tree exceeds the size of available nursery stock

C. The tree has just been planted from a container

D. The tree is being valued as cordwood for fuel

186. The 10-20-30 rule limits the percentage of urban trees from any single:

A. Species, genus, and family group

B. Native and non-native combination

C. Color of fall foliage on city streets

D. Cultivar within a single municipal park

187. A community choosing to maximize ecosystem service value per planting site should select trees that:

A. Are smallest at maturity to maximize density

B. Are guaranteed to be resistant to all pests

C. Will reach the largest healthy mature size for the site

D. Require the least nursery investment per tree

188. The i-Tree suite quantifies which of the following for urban tree populations?

A. Genetic diversity within each species planted

B. The frequency of structural defects per tree

C. Future growth rates predicted by climate model

D. Stormwater interception, energy savings, and air quality

189. Species rating reflects local desirability and suitability, while the condition rating reflects:

A. The lumber market value of the wood

B. The current health and structural state of the tree

C. The exact dollar replacement cost of the tree

D. The current real estate value of the property

190. A typical tree protection ordinance distinguishes between protected and unprotected trees based on:

A. Size, species, or location criteria

B. The age of the homeowner who planted them

C. The total dollar value of the surrounding land

D. The political affiliation of the property owner

191. The combined cooling and stormwater benefits of urban canopy are best communicated to a budget-focused audience by:

A. Photos of beautiful trees in glossy brochures

B. Personal anecdotes from neighborhood residents

C. Documented dollar values from analysis tools

D. Detailed botanical descriptions of each species

192. When recommendations involve significant cost, an arborist should:

A. Withhold cost information until after the work

B. Make decisions without consulting the owner

C. Use pressure tactics to close the sale quickly

D. Present options in plain language and respect the owner's choice

193. The combination of native species selection and the 10-20-30 rule represents a strategy for:

A. Both ecological support and pest-loss resilience

B. Eliminating all maintenance from urban trees

C. Maximizing the average growth rate of plantings

D. Reducing the total tree count in every community

194. A community pursuing Tree City USA status must maintain all of the following EXCEPT:

A. A tree board or department for tree management

B. A minimum forty percent canopy cover requirement

C. A tree care ordinance adopted by local government

D. An annual Arbor Day observance with proclamation

195. A complete tree inventory supports management primarily by providing:

A. A list of trees scheduled for removal in one year

B. A statistical estimate of total trees in a region

C. Detailed data on every tree for planning decisions

D. A comparison to forests outside the urban area

196. Which of the following is NOT a documented benefit of urban tree canopy?

A. Higher rates of asthma in residential neighborhoods

B. Reduced summer cooling costs for nearby buildings

C. Improved mental health outcomes for residents

D. Stormwater interception during heavy rainfall

197. The trunk formula method calculates tree value from trunk cross-sectional area adjusted by:

A. The exact age of the tree being valued

B. The total height of the tree in meters

C. The number of leaves on the tree at peak season

D. Species, condition, and location ratings

198. A diverse urban forest planting following the 10-20-30 rule is most resilient to:

A. Heavy snowfall during a single winter

B. Catastrophic loss from a species- or genus-specific pest

C. Routine summer drought conditions

D. Long-term changes in regional climate

199. Communicating with property owners about recommended tree work requires the arborist to:

A. Use the most technical vocabulary available

B. Withhold information that might cause concern

C. Present options in plain language with respect

D. Make all decisions on the owner's behalf

200. An urban forester quantifying the ecosystem service value of a city's canopy would most appropriately use:

A. The i-Tree suite of analytical tools

B. A traditional plant taxonomy textbook

C. A nursery stock pricing catalog from suppliers

D. Real estate market valuations of nearby parcels

PRACTICE EXAM 9 — ANSWER KEY AND EXPLANATIONS

1. C — Wilting despite adequate soil moisture indicates a damaged root system that cannot absorb the water that is present. This pattern is common after construction damage, root rot, severe compaction, or other root injuries. The visible symptom is wilting, but the cause is below ground.

2. A — A rim of new wood and callus surrounding a wound is the visible product of Wall 4 formation by the cambium at the wound perimeter. Wall 4 is the strongest of the four CODIT walls and resists outward decay spread into new wood. This is why preserving the branch collar during pruning is essential.

3. B — Wind flexing stimulates the cambium to produce reaction wood and develop greater trunk taper at the base, where bending forces are greatest. Rigidly staked trees lose this stimulus and develop weaker trunks. Naturally flexed trees build strength through mechanical stress.

4. D — Closing stomata blocks the entry of carbon dioxide into the leaf, halting photosynthesis. The trade-off between water conservation and carbon gain is the central constraint on tree function under heat or drought stress. This is why drought is a starvation problem as well as a wilting problem.

5. B — A girdled tree typically declines over months to a few years as the root system gradually starves from lack of phloem sugar transport and then fails. Above-ground symptoms follow root failure rather than appearing immediately. The connection to the original girdling is often forgotten by the time decline appears.

6. A — Carbohydrate reserves fuel recovery from defoliation, drought, and wounds, allowing the tree to refoliate, repair tissues, and maintain respiration during stress. When reserves are exhausted, the tree cannot recover even if the original stressor ends. This is why repeated stress is so damaging.

7. D — A wound that fails to compartmentalize indicates poor cambial vigor and exhausted reserves, both signs of underlying stress. Vigorous trees compartmentalize effectively; stressed trees do not. This is why diagnostic assessment must consider overall tree vigor.

8. C — *Acer* (maples) has opposite leaf arrangement and produces paired winged samaras. This combination of features is diagnostic for the genus. Oaks and pines have alternate arrangement; ash has compound leaves with single samaras.

9. A — White oaks have rounded leaf lobes and acorns that mature in a single growing season. Red oaks have pointed bristle-tipped lobes and acorns maturing over two seasons. These differences are the primary distinction between the two oak groups.

10. B — A non-native species that causes ecological harm is best termed invasive and naturalized. The threshold for "invasive" is documented harm, not merely being non-native. Tree of heaven and Norway maple are common examples in eastern North America.

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

12. 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. The hierarchy protects against threats at each taxonomic level. Dutch elm disease and emerald ash borer illustrate why diversity matters.

13. A — A flowering crabapple reaching about 20 feet stays safely below a 30-foot distribution line and is a correct application of Right Tree, Right Place. Pin oak, tulip poplar, and red oak all far exceed the height limit. Mature size, not planting size, governs the decision.

14. B — Cultivar names are written in single quotation marks and are not italicized, while the genus and species are italicized with the genus capitalized. *Acer rubrum* 'October Glory' follows the international code of nomenclature for cultivated plants. Other formats violate the typographic rules.

15. D — Native species have co-evolved with local ecological communities, including pollinators, insects, birds, and soil organisms. This makes them ecologically valuable, but does not give them automatic immunity from pests or guaranteed faster growth. Co-evolution is the genuine advantage.

16. A — 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.

17. C — A pinnately compound leaf has fully separated leaflets along a central rachis, while a simple lobed leaf has lobes that remain connected to the central blade. The leaflets of a compound leaf are completely independent structures. A bud at the base of the petiole confirms a true compound leaf.

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

19. D — 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.

20. A — 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.

21. C — Loam is a soil texture with roughly balanced proportions of sand, silt, and clay. With good organic matter content, it drains adequately, holds moisture, and supports good structure. Loam is the ideal texture for most tree species.

22. B — 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.

23. D — 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.

24. A — 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.

25. C — 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.

26. D — 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.

27. A — 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.

28. C — 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.

29. 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.

30. A — Continuous addition of organic matter improves soil structure by promoting aggregation and increasing pore space. Lime addresses pH but not structure; sand often makes clay soils worse. Organic matter is the only practical long-term solution.

31. D — 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.

32. B — A proper mulch layer 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.

33. C — 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.

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

35. D — 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.

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

37. C — 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.

38. A — 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.

39. D — 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.

40. 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.

41. B — 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.

42. 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.

43. A — 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.

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

45. D — 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.

46. B — 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.

47. A — 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.

48. C — 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.

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

50. 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.

51. 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.

52. C — 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.

53. 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.

54. D — 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.

55. 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.

56. C — 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.

57. B — 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.

58. A — 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.

59. D — 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.

60. B — 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.

61. 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.

62. A — 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.

63. D — 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.

64. B — 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.

65. A — 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.

66. C — 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.

67. 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.

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

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

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

71. D — 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.

72. A — 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.

73. B — 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.

74. D — 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.

75. C — 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.

76. A — 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.

77. 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.

78. 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.

79. C — 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.

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

81. C — 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.

82. A — 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.

83. D — 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.

84. B — 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.

85. A — 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.

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

87. B — 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.

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

89. A — 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.

90. D — 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.

91. B — 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.

92. 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.

93. A — 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.

94. D — 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.

95. B — 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.

96. A — 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.

97. 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.

98. D — 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.

99. B — Wilting despite adequate soil moisture indicates a damaged root system that cannot absorb the water that is present. This pattern is common after construction damage, root rot, severe compaction, or other root injuries. The visible problem is wilting, but the cause is below ground.

100. C — A primary pest can attack and kill healthy, vigorous trees on its own, while a secondary pest attacks only stressed trees. Emerald ash borer is the textbook example of a primary pest. The distinction is critical for management strategy.

101. A — 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.

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

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

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

105. 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.

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

107. C — 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.

108. B — 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.

109. 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.

110. A — 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.

111. 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.

112. B — 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.

113. 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.

114. D — 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.

115. 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.

116. C — 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.

117. 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.

118. D — A tree that has contacted an energized line should be treated as potentially energized until the utility confirms de-energization. A branch in contact with a line can energize the entire tree, including trunk and lower branches.

119. 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.

120. B — 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.

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

122. A — 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.

123. D — 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.

124. B — 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.

125. C — 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.

126. A — 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.

127. D — 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.

128. B — 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.

129. 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.

130. 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.

131. D — 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.

132. 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.

133. C — 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.

134. B — A professional risk assessment report should document the scope of the assessment, identified defects, targets, recommended mitigation, and an explicit residual risk statement. Thorough reporting supports defensibility and client decision-making.

135. D — 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.

136. 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.

137. B — 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.

138. D — 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.

139. A — 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.

140. C — 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.

141. B — 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.

142. A — 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.

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

144. B — 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.

145. C — 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.

146. A — 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.

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

148. C — 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.

149. B — 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.

150. A — 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.

151. D — 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.

152. B — 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.

153. C — 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.

154. A — 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.

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

156. B — 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.

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

158. A — 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.

159. D — 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.

160. B — 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.

161. B — 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. Workers who remain at the stump are in the most dangerous position.

162. D — 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.

163. A — 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.

164. C — 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.

165. B — 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.

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

167. A — 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.

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

169. 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.

170. B — 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.

171. A — 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.

172. D — 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.

173. B — 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.

174. 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.

175. A — 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.

176. D — 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.

177. C — 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.

178. 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.

179. A — 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.

180. D — 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.

181. B — 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.

182. C — 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.

183. A — The combination of native habitat support and urban climate cooling makes the strongest case for increased canopy cover in urban communities. Both ecological and climate benefits scale with canopy area. This dual rationale supports advocacy across diverse audiences.

184. D — A complete tree inventory records every tree within the defined area, with full data on each. A windshield survey is a rapid visual screen that does not produce this detailed data. Complete inventories provide the richest basis for management.

185. B — The trunk formula method is used when a tree exceeds the size of available nursery stock and cannot be replaced. It calculates value from trunk cross-sectional area adjusted by species, condition, and location ratings. Smaller replaceable trees use the replacement cost method instead.

186. A — 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.

187. C — A community maximizing ecosystem service value per planting site should select trees that will reach the largest healthy mature size for the site. Larger mature trees provide far greater stormwater interception, cooling, and carbon storage. Site-appropriate scale is the key.

188. D — The i-Tree suite quantifies stormwater interception, energy savings, air quality improvement, and carbon storage for urban tree populations. These metrics translate tree management into documented infrastructure investment. They are widely used in budget justifications.

189. B — Condition rating reflects the current health and structural state of the tree being appraised. Species rating reflects local desirability; together with location, they adjust the trunk formula calculation. Both ratings are needed for a complete appraisal.

190. A — Tree protection ordinances typically distinguish between protected and unprotected trees based on size, species, or location criteria. Permits are required for removal of protected trees, with penalties for unauthorized removal. Specific thresholds vary between jurisdictions.

191. C — A budget-focused audience responds to documented dollar values from analysis tools such as i-Tree, not to aesthetic photos or anecdotes. Matching the message to the audience is basic professional communication. Quantitative data supports budget justification.

192. D — When recommendations involve significant cost, the arborist should present options in plain language and respect the owner's decision-making authority. Withholding information, making decisions for the client, and pressure tactics all damage credibility. The client owns the tree.

193. A — Native species selection supports local ecology, while the 10-20-30 rule provides resilience against catastrophic pest loss. Combined, the two strategies serve both ecological support and pest-loss resilience. Both are core principles of urban forest management.

194. B — Tree City USA does not require a minimum canopy cover percentage. The four required elements are a tree board, tree care ordinance, community forestry program with at least $2 per capita, and an Arbor Day observance. Coverage targets are set at the community's discretion.

195. C — A complete tree inventory provides detailed data on every tree within the defined area, supporting informed management decisions. Sample inventories and removal lists are far less complete. Detailed data enables planning and budgeting.

196. A — Higher rates of asthma have not been documented as a benefit of urban tree canopy — in fact, urban tree canopy is associated with improved respiratory health overall. The other options are all genuine documented benefits. The question asks what is NOT a benefit.

197. D — The trunk formula method calculates tree value from trunk cross-sectional area adjusted by species rating, condition rating, and location rating. These three modifiers refine the base value to reflect the specific tree. The formula is the standard for trees too large to replace.

198. B — A diverse urban forest planted under the 10-20-30 rule is most resilient to catastrophic loss from species-, genus-, or family-specific pests. The hierarchy of diversity protects at multiple taxonomic levels. Dutch elm disease and emerald ash borer illustrate the rule's importance.

199. C — Effective communication with property owners presents options in plain language and respects the owner's decision-making authority. Technical jargon, withholding information, and making decisions for the client all damage credibility. The client owns the tree.

200. A — The i-Tree suite developed by the USDA Forest Service is the standard tool for quantifying ecosystem service value of urban canopy. It provides documented dollar values for stormwater interception, air quality, carbon sequestration, and energy savings. It is the appropriate tool for budget advocacy.