

ISA Certified Arborist Exam Outline

I. Soil Management

A. Soil

1. Soil formation and horizons
2. Urban soils
3. Physical properties
4. Biological properties
5. Chemical properties
6. Soil improvement

B. Water

1. Properties
2. Management

C. Mineral Nutrition

1. Plant requirements
2. Fertilizer

II. Tree ID/Selection

A. Nomenclature

B. Classification

(Coniferous/Deciduous/Palms)

1. General
2. Specific

C. Tree Characteristics

1. General characteristics
2. Specific characteristics

D. Selection

1. Health/quality/survivability
2. Function
3. Aesthetics

III. Installation and Establishment

A. Installation

1. Site evaluation
2. Preparing planting area
3. Proper placement of tree in planting area
4. Proper handling of planting stock
5. Impact of soil amendments on tree establishment
6. Principles of back filling and berming

B. Post-Planting

1. Appropriate watering schedule program
2. Mulching program for the planting site
3. Wrapping the trunk
4. Tree support and protection system
5. Pruning
6. Planting time
7. Fertilizing for early establishment
8. Need for continued care

C. Transplanting

1. Principles
2. Techniques
3. Transplanting collected stock wildlings
4. Problems

IV. Safe Work Practices

A. Safety Recognition

1. Recognizing industry standards

B. Work Site Safety Hazards/Appropriate Actions To Be Taken

1. Hazard recognition
2. Traffic control
3. Communication
4. Planning/organization/job briefing
5. Safety equipment accessibility/safety skills

C. Rescue Procedure

1. Techniques of aerial/bucket rescue
2. First Aid

D. Climbing/Equipment/Technical

1. Types, use, maintenance, and inspection of climbing and safety equipment
2. Techniques when climbing/working in and around trees
3. Techniques and equipment used in rigging and tree removal
4. Knots and ropes used in tree care

E. Behavior

V. Tree Biology

A. Structure

1. Gymnosperms, angiosperms
2. Palms only

B. Function

1. Photosynthesis & respiration
2. Transport
3. Storage

C. Growth & Development

1. Sexual reproduction
2. Vegetative growth
3. Decline and senescence
4. Dormancy
5. Environmental effect & response

D. Biomechanics

1. Mechanical
2. Wound effects & response
3. Growth form

VI. Pruning

A. General Principles of Pruning

1. General principles of pruning
2. Effects of pruning
3. Effects of timing
4. Effects on branch growth
5. Reasons for pruning

B. Techniques

1. Techniques used in making proper pruning cuts
2. Improper pruning
3. Pruning tools and their application

C. Types of Pruning

1. Cleaning
2. Reduction
3. Thinning
4. Raising
5. Vista pruning
6. Restoration
7. Ornamental/hand pruning
8. Fruit pruning
9. Pollarding
10. Espalier
11. Topiary
12. Directional
13. Subordination

D. Utility Pruning

1. Purpose
2. Techniques

E. Recognizing Industry Standards & Best Manage Practices

1. ISA
2. TCIA
3. ANSI/CSA
4. OSHA
5. Other

VI. Diagnosis/Treatment

A. Plant Health Care

1. Good tree health, what is normal/what is unhealthy
2. Evaluate what might lead to stress
3. Signs and symptoms

B. Diagnosis, Procedures and Techniques

1. Employ techniques to identify
2. Observation and history
3. Tools (books, labs, etc.)
4. Conclusions and recommendations

C. Insect, Nematodes, Diseases and Mites

1. General concepts
2. Piercing/sucking/rasping
3. Chewing
4. Borers
5. Galls
6. Vectors

D. Diseases

1. General concepts
2. Fungi
3. Bacteria
4. Viruses, Mycoplasma-like organisms / phytoplasmas, etc.

E. Abiotic: Physiological Problems, Mech/Struct, Climate/Micro, Animal

1. Other plant problems
2. Climate
3. Animal
4. Physiological disorders

F. Treatment

1. Assess potential impact
2. Management principles
3. Treatment options

VIII. Urban Forestry

A. Benefits and Costs of Trees

1. Sociological
2. Environmental

B. Appraisal and Valuation

1. Single tree benefits (appraisal)
2. Community tree benefits

C. Regulatory and Legal Issues

1. Liability issues
2. Insurance issues
3. Ordinances
4. License and permit requirements
5. Tree preservation
6. Planting and tree care standards

D. Management

1. Site assessment
2. Tree selection
3. Insects and diseases
4. Protection
5. Tree inventories
6. Invasive species

E. Information and Education

1. Audience types
2. Topics

IX. Protection and Preservation

A. Protection

1. Planning/evaluation
2. Individual parts
3. Whole tree
4. Construction techniques

B. Damage

1. Roots
2. Trunk
3. Crown
4. Whole tree

C. Post Damage Management

1. Roots
2. Trunk
3. Crown
4. Whole tree

X. Tree Risk Management

A. Responsibility/Liability

1. Documentation
2. Notification
3. Risk assignment

B. Site Analysis

1. Target
2. Site disturbance

C. Tree Risk Characters

1. Decay/hollows/fungal fruiting bodies
2. Cracks
3. Branch condition
4. Lean
5. Weak crotches/multiple weak branches
6. Structural root damage
7. Species history of failure
8. Lightning injury
9. Edge trees
10. Improper tree cultural practices
11. Form & growth rate

D. Tree Analysis

1. Visual inspection
2. Sounding
3. Drilling techniques (drill/resistograph)
4. Trunk flare/root excavation (pneumatic air tools)
5. New technology

E. Risk Based On Tree Characteristic For Location

1. Thorns
2. Fruit
3. Line of sight blockage

F. Risk Mitigation

1. Prioritize
2. Options