

# Exam Outline

## ISA Certified Arborist Exam

### I. Soil Management

#### A. Soil

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

#### B. Water

1. Properties
2. Management

#### C. Mineral Nutrition

1. Plant requirements
2. Fertilizer

### II. Tree ID/Selection

#### A. Visual Tree Identification

#### B. Nomenclature

#### C. Classification (coniferous/deciduous/palms)

#### D. Tree Characteristics

1. General characteristics
2. Specific characteristics

#### E. Selection

#### F. Health/Quality/Survivability

1. Function
2. 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

## **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
  - 6. Training/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

## **V. Tree Biology**

- A. Tree Anatomy
  - 1. Gymnosperms, Angiosperms
  - 2. Palms
- B. Processes
  - 1. Photosynthesis
  - 2. Storage
  - 3. Respiration
  - 4. Transpiration
  - 5. Adsorption
  - 6. Translocation
  - 7. Stabilization
  - 8. Control of growth and development
  - 9. Defensive systems
  - 10. Propagation
  - 11. Dormancy

## **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. Pruning tools and their application
3. Recognizing industry standards

## C. Improper Pruning

## D. Secondary Problems

## E. Types of Pruning

## F. Utility Pruning

# VII. 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 and Mites

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

## D. Diseases

1. General concepts
2. Fungi
3. Bacteria
4. Viruses, MLO's, etc.

## E. 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 principals
3. Treatment option

# 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. Tree selection
2. Insects and disease
3. Preservation
4. Tree inventories

### E. Information and Education

1. Audience types
2. Topics

## **IX. Protection and Preservation**

### A. Protection

1. Planning/evaluation
2. Individual parts
3. Whole tree

### 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

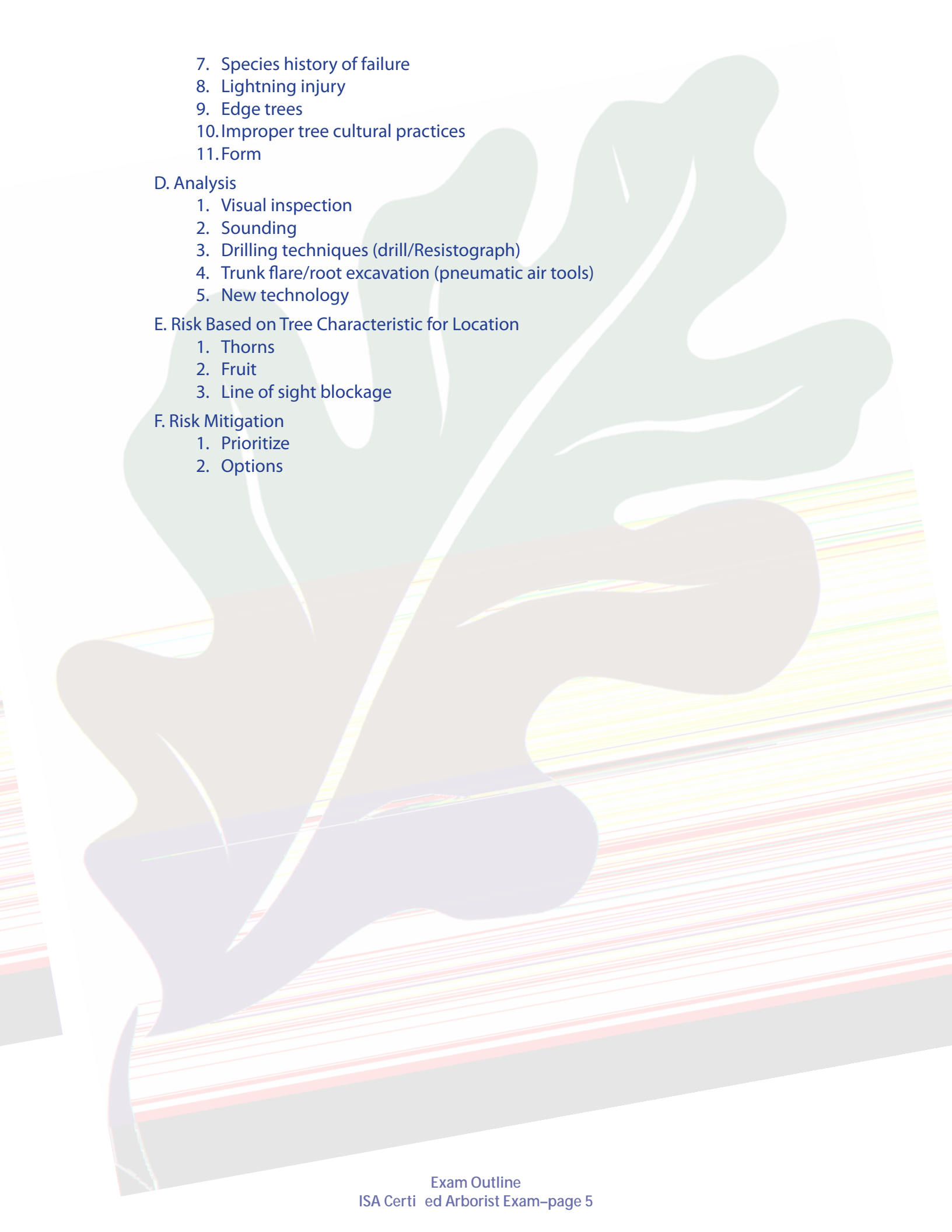
1. Documentation
2. Notification
3. Risk assignment

### B. Site/Tree Analysis

1. Target
2. Tree prone to failure
3. 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

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7. Species history of failure
  8. Lightning injury
  9. Edge trees
  10. Improper tree cultural practices
  11. Form

#### D. 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