

# FFA FORESTRY TEST BANK



STATE DEPARTMENT OF EDUCATION  
OFFICE OF CAREER AND TECHNICAL EDUCATION  
AGRISCIENCE EDUCATION  
MONTGOMERY, ALABAMA

## FORWARD

This FFA Forestry Test Bank has been developed as a study guide for students studying forestry. This bank consists of questions and answers relating to all aspects of the forest industry.

The questions have been categorized into twelve areas of study.

- General Forestry
- Safety
- Silviculture
- Tree Identification
- Tree Physiology
- Instruments and Equipment
- Measurements and Mapping
- Forest Insects and Diseases
- Utilization
- Wildlife
- Fire
- Sample Problems

The questions for the General Forestry Knowledge Written Test phrase of the FFA Forestry Judging Contest at the district and state levels will be taken from the questions in this publication.

This FFA forestry Test Bank contains 388 questions. However, several of the questions can be divided into a large number of additional questions. For example: a large number of questions can be developed from TREE IDENTIFICATION, questions 15-20; or, INSTRUMENTS AND EQUIPMENT, question 18. Additional questions can be developed from the questions dealing with measurements in MEASUREMENTS AND MAPPING or the math problems in SAMPLE PROBLEMS by simply changing the numbers in these questions. Any additional questions developed and used on the forestry written test will be based on the same process or procedure as those in this bank. Only the numbers will be changed.

This FFA forestry Test Bank was developed as a cooperative effort by representatives from the Alabama Forestry Commission and Agribusiness Education. The following people are extended a sincere appreciation for their work on this publication: Ms. Madeline W Heldreth, Staff Forester, Alabama Forestry Commission; Mr. Roger Brothers, Agribusiness Teacher, Bibb County AVTC; Mr. Johnny Andrews, Agribusiness Teacher, Monroe County AVTC; Mr. George J. Simpkins, Agribusiness Teacher, Thomasville High School; and Mr. Lamar Dewberry, Agribusiness Teacher, Lineville High School.

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## GENERAL FORESTRY

1. What is the name of the state forestry agency?  
Alabama Forestry Commission
2. How much of Alabama's land is forested?  
2/3 or 66%
3. What is Alabama's state tree?  
Longleaf Pine
4. What are the four major pines in Alabama?
  - Longleaf
  - Slash
  - Loblolly
  - Shortleaf
5. Who owns the majority of Alabama's land?  
Private landowners
6. What is the single most damaging forest enemy in Alabama?  
Southern Pine Beetle
7. What are Best Management Practices or BMP's?  
Voluntary guidelines used in forestry practices to maintain and protect water quality.
8. What is a streamside management zone or SMZ?  
A strip of land immediately adjacent to water where soils, organic matter and vegetation are managed to protect the adjacent water and downstream from forestry operations. Some trees are usually left uncut in an SMZ.
9. What is the national organization for professional foresters?  
Society of American Foresters
10. What is conservation?  
The wise use, over a period of time, of natural resources.

11. Why can Alabama compete with other sections of the country in the economical production of forests and forest products?  
Because of heavy rainfall, long growing seasons, and soils adapted to trees.
12. Upon what does the continued prosperity of Alabama depend?  
How wisely its renewable forest resources are protected and harvested.
13. List four important natural resources in Alabama.
  - Soil
  - Water
  - Forests
  - Wildlife
14. How do trees help conserve soil?  
Prevent soil erosion
15. What does a forest cover provide for wildlife?
  - Food
  - Protection
  - Breeding places
16. What is an ecosystem?  
The interacting system of all living things and the environment in which they live.
17. What are microorganisms?  
Fungi, viruses, and bacteria that contribute to the life cycle of all organisms.
18. What are carnivores?  
Animals that eat the flesh of other animals.
19. What are herbivores?  
Animals that eat mainly grass and green plants.
20. What is a forest?  
A living, self-renewing ecosystem involving a complex association of plants and animals in which each individual plays some part in the life of the community.

21. What is forestry?  
Forestry is the art and science of managing the forest so as to yield the maximum quantity and quality of forest products and services on a continuous basis.
22. What elements comprise a forest community?
- Trees
  - Plants
  - Shrubs
  - Soil
  - Water
  - Animal life
  - Human life
  - Fire
23. When was the American Forestry Association founded?  
1875
24. What year did the Forest Service become part of the Department of Agriculture?  
1905
25. What tree species represents the largest volume of timber and has the widest range in Alabama?  
Loblolly Pine
26. What is the most common use of the trees of the forest?  
Timber and wood products
27. What does a forest provide?
- Oxygen for the atmosphere
  - Protective cover for wildlife
  - Timber products for people
  - Food for wildlife
28. How do trees differ from other farm commodities?
- Trees can be stored on the stump until market conditions improve
  - Trees are accessible to many different markets
29. What explains the peak in pine tree planting that occurred in Alabama during the years 1958 and 1962?  
The Soil Bank Program

30. What is the name of the federal agency that manages National Forests?  
United States Forest Service

## SAFETY

1. What is the first thing to do to a person after an accident?  
Make sure the injured person's air passage is open and that the person is breathing.
2. When a person has stopped breathing, usually what is done?  
Open up the air passage.
3. Describe what is known as the "head tilt."  
Lift the neck with one hand while pushing down on the forehead with the other hand to tilt the head back.
4. If a person doesn't start breathing after performing the "head tilt," what is the next thing to do?  
Perform mouth-to-mouth resuscitation.
5. Almost all bleeding, no matter how bad, can be stopped by doing what?  
Putting direct pressure on the wound with your hand, combined with elevating the extremity above the heart if possible.
6. What causes shock?  
Loss of blood and from psychological stress involved.
7. How can a person be treated for shock?  
Try to maintain the patient's body temperature by using a blanket or your coat; and if it's very cold, by getting down with the victim so your body heat can help warm him/her.
8. If you don't feel well in hot weather, what two things should be done?
  - Don't continue to push yourself
  - Contact a physician
9. List six poisonous snakes found in Alabama.
  - Eastern diamondback rattlesnake
  - Timber rattlesnake
  - Pigmy rattlesnake
  - Copperhead
  - Cottonmouth
  - Coral snake

10. What is meant by saying that snakes are “cold-blooded?”  
Their body temperature is regulated by factors such as the air temperature or exposure to sunlight.
11. Describe the head comparisons of pit vipers and other snakes.  
  
Pit vipers have pits on both sides of the face between the eye and nostril. They have vertical or “cat-like” pupils, thin necks, heavy bodies, wide triangular heads, and a single row of scales.
12. Describe conditions that provide good habitat for snakes.  
Old rock or wood piles, brush and trash.
13. How does poison ivy usually grow?  
As a climbing vine in wooded areas.
14. How does poison oak grow?  
As a low-growing shrub.
15. How many leaflets does Virginia creeper have?  
Five.
16. Poison sumac grows most commonly along what area?  
Wet acid soil.
17. Explain how poison ivy and poison oak may be controlled mechanically.  
Carefully digging out an occasional plant. All roots should be dug up and removed. This is done best in early spring when soil is moist.
18. Explain how herbicides may be used by landowners to increase forest productivity.
  - They help prepare sites for tree planting.
  - They reduce competition from herbaceous weeds.
  - They help to stimulate growth in established stands by selective removal of non-crop trees.
19. Explain the following information categories in regard to herbicides.
  - Activity - refers to how the chemical enters the plant.
  - Movement in Plants - refers to how chemicals are transported up and down in the plant.
  - Mode of Action - a brief description given of how the chemical affects plant biochemistry.
  - Selectivity - general classes of plants which are resistant to the effects of the chemical.



20. List eight safety practices to follow when using pesticides.
- Read the label carefully
  - Wear appropriate personal safety equipment
  - When mixing and loading ag chemicals, prevent spills.
  - While filling sprayers, avoid back siphoning.
  - Never exceed labeled chemical rates
  - Prevent leftover pesticides by mixing only needed quantities
  - Never rinse equipment near wellheads, ditches, streams or other water sources.
  - Always triple rinse or pressure rinse a chemical container before disposing or recycling.
21. Why should chain saws be inspected daily?
- To assure that all handles and guards are in place and tight, that all controls function properly, and that the muffler is operative.
22. Where should the saw be placed before starting?
- On the ground.
23. How far away from the fueling area should you be before starting the saw?
- At least 10 feet.
24. Explain how or what to do when carrying the saw.
- Carry the saw in a manner to prevent contact with the chain and muffler.
25. What things should be appraised before cutting a tree?
- Dead limbs
  - The lean of the trees to be cut
  - Wind conditions
  - Location of other trees
  - Other hazards
26. How should undercuts be made?
- Make undercuts about one-third the diameter of the tree to guide the tree and reduce the possibility of its splitting.
27. How should trees be felled?
- Fell trees from the uphill side and arrange to keep uphill from previously felled trees on terrain where trees are likely to slide or roll.

28. How should trees be bucked?

Buck from the uphill side on slopes unless the log has been securely blocked to prevent rolling or swinging.

29. Why should spring poles be cut?

So that the operator is clear when the tension is released.

30. Describe how to pile trees for bucking?

Pile trees for bucking in an orderly, parallel manner that minimizes hazard to fellow employees.

31. List five symptoms of spider bites.

- Minor to severe swelling
- Itching
- Nausea
- Blistering
- Pain

32. Which spider is considered the most venomous in North America?

Black Widow

33. What are the symptoms of the black widow spider bite?

- Bite looks like a pin prick
- Severe pain caused by nerve toxin starts within minutes and spreads throughout the body
- Profuse sweating, nausea, and cramps
- Breathing and speaking are difficult

34. Describe the color and marking of a brown recluse spider.

- Color is tan to dark brown body with lighter brown head
- Dark “fiddle” on the back of the head

35. Where do brown recluse spiders live?

They are usually found hiding in buildings, closets, old clothes, or on the underside of tables and chairs. Outside, they live under rocks and bark.

36. Describe the symptoms of a brown recluse spider bite.
- A painful bite area swells and grows hard
  - Blisters or ulcers will form
  - A rash over the body may occur within 24-48 hours
  - Within one to two weeks, the skin and muscle at the bite area sloughs off
  - Chills, fever, nausea, and vomiting occur
  - Can leave severe scars
37. How do ticks attack an individual?
- Ticks are blood-sucking insects that burrow into the skin.
38. Ticks are carriers of what two ailments?
- Rocky Mountain Spotted Fever
  - Lyme Disease
39. Describe the symptoms of Rocky Mountain Spotted Fever.
- Causes high temperatures (103-105°) and severe headaches. Most people develop a characteristic spreading rash, beginning as flat red spots or splotches on the palms of the hands or soles of the feet. If the disease is not treated, it can damage the kidneys, liver, lungs and blood.
40. Describe Lyme Disease symptoms.
- Symptoms may start with a bull's-eye shaped rash, followed by flu symptoms. Months later, paralysis, pain, arthritis, and birth defects may follow.
41. Which tick is the carrier of Rocky Mountain Spotted Fever?
- The Lone Stone Tick.
42. Describe the treatment for removing ticks.
- Carefully remove ticks with tweezers immediately. Grab the tick as close to the skin as possible and pull gently straight out. Wash the area with soap and water. Use a topical antiseptic and for the next few weeks, watch for symptoms of Rocky Mountain Spotted Fever and Lyme Disease.
43. What are "heat cramps?"
- Muscular pains and spasms due to loss of salt through sweating or to inadequate intake of salt.

44. What is “heat exhaustion?”

Fatigue, weakness, and sometimes collapse due to loss of body fluids through sweating and lack of adequate water intake. Heat exhaustion is the most common heat hazard experienced while working in the field.

45. On what part of the body is a snake bite most likely to occur?  
On the ankle and lower calf.

46. List the proper clothing to wear when working in warm weather.

- Long-sleeve shirt
- Long-leg trousers
- Safety shoes or high-lace field boots with hard toes
- A hat with a brim

47. What should one do when lost?

- Keep calm
- Head downhill if no compass reading is available
- Follow streams downstream

## SILVICULTURE

1. What is silviculture?  
The theory and practice of controlling forest establishment, composition and growth.
2. List four timber harvest methods.
  - Clearcutting
  - Shelterwood cutting
  - Seed-tree cutting
  - Selection cutting
3. What is a clearcutting?  
Removal of the entire stand in one cut leaving an area on which the entire stand has been removed. Used to regenerate even-aged stands.
4. What is shelterwood cutting?  
Harvest cutting method whereby only a portion of the stand is removed at any one time. Its purpose is to obtain natural reproduction under the partial shelter of a large number of seed trees. Used to regenerate even-aged stands.
5. What is a seed-tree cutting?  
Harvest cutting similar to clearcutting, except that seedbearing trees are left suitably disbursed throughout the harvest area to provide for reproduction. An area on which the entire timber stand has been cut. Used to regenerate even-aged stands.
6. What is selection cutting?  
A complex method of cutting and removing individual trees throughout the stand upon maturity, growth, diameter and vigor. It is a form of sustained yield harvest, regenerating uneven-aged stands.
7. What is the coppice forest method?  
A method of hardwood stand reproduction in which the cut trees produce sprouts or suckers.

8. What are the five principal objectives of intermediate cuttings?
  - The improvement of the existing stand
  - The manipulation or regulation of tree and stand growth
  - The opportunity for early financial returns
  - The reduction of conditions favorable to forest pests such as insects and diseases
  - The creation of conditions favorable to reproduction
9. What are intermediate cuttings?

Cuttings made in a stand between the time of its formation and its major harvest.
10. What is a thinning?

A form of intermediate cutting in immature or young trees which improves the yield of the stand as a whole.
11. What is a pre-commercial thinning?

Thinning of a stand before trees are merchantable.
12. When is pre-commercial thinning used?

When a stand's growth will stagnate before merchantability, usually on naturally regenerated or direct seeded stands.
13. What is stagnation?

Tree growth slows drastically and responds very little to thinning.
14. Which of Alabama's four commercial pine species is most susceptible to stagnation?

Slash pine
15. What is pruning?

The removal of live or dead branches from standing trees. This may be done naturally or artificially.
16. What is sanitation cut?

Cutting to remove trees infested with insects or attacked by diseases. It removes all injured, diseased or vulnerable trees in a stand regardless of merchantability.

17. What is a salvage cut?  
A cutting used to remove trees that have been or may be killed or damaged by injurious agents such as insects, ice, wind, diseases. Salvage cuts are the primary control for southern pine beetle infestations.
18. What is sustained yield?  
Continuous production with the aim of achieving a balance between net growth and harvest.
19. What are the four main crown classes?  
- Dominant  
- Codominant  
- Intermediate  
- Suppressed (overtopped)
20. What is the canopy?  
The crown cover of green leaves and branches formed by the crowns of all trees in a forest.
21. What is the overstory?  
The portion of the trees in a stand forming the upper crown cover.
22. What is understory?  
The portion of trees in a stand below the overstory.
23. What is rotation?  
The period of years needed to grow a crop of trees to the specified size, harvest the trees and regenerate the stand.
24. What are three methods of site preparation?  
- Chemical  
- Mechanical  
- Prescribed burning
25. Which method of site preparation is the cheapest?  
Prescribed burning
26. What are two methods of regenerating a stand?  
Natural and artificial

27. What are two ways stands are regenerated artificially?
- Planting – hand or mechanical
  - Direct seeding
28. What is a stand?
- A continuous group of trees, uniform in composition, age and arrangement to be distinguishable from other areas.
29. What is a mixed stand?
- A stand with less than 75% of the trees in the main crown canopy are a single species.
30. What is a pure stand?
- A stand in which at least 75% of the trees in the main crown canopy are a single species (example: pine plantation)
31. What is an even-aged stand?
- 80% of the stand is the same age.
32. What is an uneven-aged stand?
- A stand with 3 or more age classes.
33. What is stocking?
- The number of trees, basal area or volume per acre of an area.
34. What is overstocking?
- The stocking of a stand is more than the desirable number of trees, basal area or volume per acre needed to attain a given management objective.
35. What is understocking?
- The stocking of a stand is less than the desirable number of trees, basal area or volume per acre needed to attain a given management objective.
36. What is a wolf tree?
- A tree of generally poor quality with a large, limby crown which interferes with growing space of better trees.
37. What is multiple use management?
- Managing the forest for more than one objective. For example, the forest may be managed for timber and wildlife or for timber, aesthetics and recreation.



38. What are herbicides?  
Chemicals used to control unwanted plants.
39. What are three basic situations for use of forest herbicides?
- Site preparation
  - Herbaceous weed control
  - Pine release
40. What is girdling?  
The cutting or removal of cambium from around the stem with the objective of killing the tree.
41. What herbicide is most widely used for kudzu control?  
Tordon
42. What is site index?  
An indirect measure of site quality for a given species – usually the height of the dominants at a given base age (25, 50, or 100 years).
43. What does TREASURE represent?  
Timber, Recreation, Environment, Aesthetics, Sustained Usable Resource.
44. In the Southeast, the site index is based on a standard of \_\_\_\_\_ years.  
50 years
45. Why is total height used in determining site index?  
Because the rate of height growth varies very little with stocking.
46. The degree of timber stocking in managed forests may be controlled by what activity?  
Periodic thinnings.
47. What are the two bases of productivity or site-quality classifications in use in forestry?
1. To recognize purely relative site classes and expressing the quality in terms of excellent, good, average, poor, or very poor.
  2. Use is made of an index number which is the key to the productivity of the area called the site index.

48. When is the best time to plan on regenerating a stand of trees?  
Before harvest.
49. What is meant by natural regeneration?  
Allowing forest land to regenerate through the process of reseeding on its own, along with proper management. Seedlings are not planted.
50. What does the number of seed trees left depend upon?
- Size
  - Species
  - Cone-bearing characteristics
  - Site conditions
51. What is/are the advantage(s) in clearcutting in strips?  
Enables a person to make periodic harvest cuts while managing even-aged units.
52. What does shelterwood cutting entail?  
Leaving many seed trees
53. What does seed-in-place involve?  
Clearcutting the stand after the peak of seed fall, but before the start of germination.
54. What does seedling-in-place involve?  
Clearcutting a stand during the summer following a good seed year.
55. List three advantages of artificial regeneration.
- The risk factor is generally low for planting.
  - Planting allows row integrity for mechanized timber harvesting operations, and it can give the highest degree of control on tree spacing and stocking density.
  - There is no need for precommercial thinning
  - Planting is ideal for pulpwood rotations.
56. List three disadvantages of artificial regeneration.
- High-quality seedlings may not be available.
  - Tree planting usually costs more than other methods.
  - Planting requires considerable quality control and direct supervision to get the best results.
  - Planting usually requires intensive site preparation.

57. List four factors that successful tree planting depends on.
- Choosing the right species and seed source
  - Preparing the site
  - Choosing proper seedlings
  - Storing, handling, and planting
58. Explain the advantage(s) of direct seeding.
- Any site that can be planted, and some that cannot be planted can be seeded.
59. Successful direct seeding will depend on what factors?
- Preparing the site
  - Buying the seed
  - Sowing
60. When is the best time to sow seed?
- In mid-February.
61. What methods are used in planting pine trees?
- Planting by hand (dibble/planting bars)
  - Planting machines
62. How deep should seedlings be planted?
- At the same depth they grew in the nursery.
63. How should trees or seedlings be handled before and during planting?
- Never allow the roots to dry out. When ready to plant, untie the bundle and place seedlings in a bucket of thin watery mud or wet sawdust deep enough to cover the roots. Remove only one seedling at a time just before planting.
64. Where may pine seedlings be obtained?
- Commercial companies
65. What soil preparation should be done before planting pine seedlings?
- Any soil preparation before planting depends upon the site and species being planted. When planting seedlings, it is unwise to plow or disk the soil immediately before planting. The greatest advantages to site preparation are the reduction of competing grasses and brush or loosening of heavy soils.

66. When should seedlings be planted?  
Usually from December 1 until March 1.
67. What spacing is recommended in planting?
- Loblolly pine: 8x8 feet
  - Slash pine: 8x8 feet
  - Shortleaf pine: 8x8 feet
  - Longleaf pine: 5x10 feet
  - Yellow poplar: 8x10 feet
68. How many pine seedlings are required to plant one acre if seedlings are spaced 6' x 8'?
- 908 seedlings
69. Does it pay to fertilize pine seedlings?
- Until current research indicates that it will pay, the practice of fertilizing pine seedlings is not recommended.
70. What is forest management?
- The application of business methods and technical forest principles to the operation of forest property.
71. What does it mean to heel-in?
- To store young trees prior to planting by placing them in a trench and covering the roots with soil.
72. What is reforestation?
- The natural or artificial restocking of an area with forest trees.
73. What is Timber Stand Improvement?
- Management practices to improve the quality and value of the trees in a stand.
74. List the advantage of natural regeneration?
- Inexpensive
  - On-going
  - Offers more variety

75. List the disadvantages of natural regeneration?
- Poor stand development
  - Poor seed placement
  - Unreliable, inconsistent results
76. What is the most common cause of seedling failure?
- Improper planting.
77. List several uses of trees.
- The production of saw logs, pulpwood, and other wood products.
78. How do forest management practices benefit wildlife?
- Provide food, water, and shelter.
79. How do trees help prevent soil erosion?
- Tree roots hold soil in place, and forest litter acts as a sponge for rain, slowly releasing the water to the soil.
80. What are waterbars?
- Low humps built across roadways at short intervals to divert water off a road.
81. List four major recreation activities in Alabama woodlands.
- Sightseeing
  - Walking
  - Picnicking
  - Camping
82. Explain the aesthetic value of trees.
- Trees add beauty to the forest. Trees with pretty fall colors or pretty flowers should be planted along roads and trails.
83. How may a tract of timber be designed as a TREASURE forest?
- A forest landowner must select a first and secondary management objective. He/she may choose timber, wildlife, recreation, aesthetics or environmental enhancement. The first and second management objectives must be accomplished in a way as to enhance or consider the remaining resource values.
84. What is the purpose of the Tree Farm System?
- To recognize landowners who are practicing forest management.

85. How should harvesting in a streamside management zone (SMZ) be done?  
So as to protect the forest floor and understory vegetation from damage.
86. In general, where should stream crossings be located?  
Where the banks and SMZ will be least disturbed.
87. What does log crossing involve?  
Placing hollow or solid logs into shallow channels.
88. Where may fords be used?  
Where the stream bed is firm, banks are low and the stream is shallow.
89. List 5 factors to consider in culvert installation.
- Place culvert on stream bottom; do no dig below natural stream level to bury pipe
  - Culvert should have 2-3% pitch downstream for self cleaning
  - Compact lower half of fill during installation.
  - Earth cover over pipe should be a minimum of 12" or half the culvert's diameter, whichever is greater. Make fill over a culvert the high spot in the stream crossing.
  - Provide for stream overflow away from culvert fill to prevent blowouts.
90. What is the most important factor in controlling soil erosion and keeping roads in a serviceable condition?  
Adequate drainage.
91. What is the purpose of crowned roads?  
To quickly drain road surfaces from the center of the road to side ditches.
92. What is the purpose of "turnout ditches"?  
To disperse water collected in roadside ditches away from the road base into surrounding vegetation.
93. What is the purpose of "outsloped roads"?  
To drain off water as quickly as possible.
94. What is the purpose of pruning trees?  
To produce higher quality logs which bring premium prices.

95. When is release, a chemical treatment of a pine plantation to reduce competing vegetation, performed?  
After planting.
96. What is/are the greatest advantage(s) of site preparation?
- Improvement of wildlife habitat
  - Reduction of competing vegetation
97. At what ground temperature should planting not be attempted?  
Below 20°F.

## TREE IDENTIFICATION

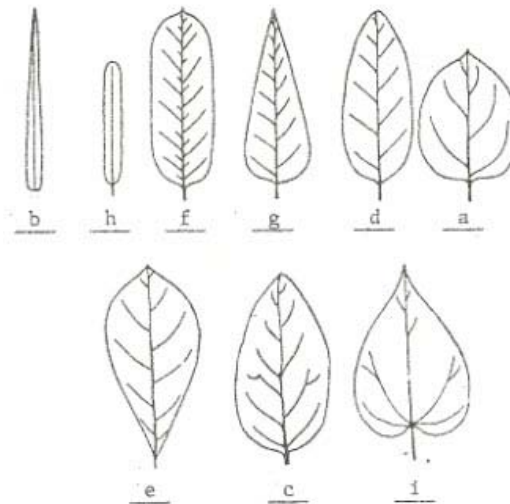
1. What is dendrology?  
The identification and systematic classification of trees.
2. What is deciduous?  
Trees which lose their leaves in the fall.
3. What is dioecious?  
Male and female flowers produced on separate plants.
4. What is monecious?  
Flowers of both sexes produced on the same plant.
5. What is an angiosperm?  
Plants having their seed borne in a ripened ovary – a covered seed, such as acorns.
6. What is a gymnosperm?  
Plants whose seeds are not enclosed, such as pines.
7. In what language are scientific names?  
Latin
8. What are some important characteristics used in tree identification?
  - Leaves
  - Twigs
  - Bark
  - Fruit
9. What are three types of leaf arrangement?
  - Alternate
  - Opposite
  - Whorled
10. What is a leaf margin?  
The outside edge of the leaf.
11. What is a habitat?  
Where a plant grows.



12. What three common trees in Alabama have opposite leaves?
- Maple
  - Ash
  - Dogwood
13. What is the difference between hardwoods and softwoods?
- Softwood trees generally have needle-like foliage and cone-like fruit such as the pines, hemlocks, cedars, and cypress.
  - Hardwood trees generally have broad leaves, most of which lose their leaves each year, such as the oaks and gums.
14. What is meant by an evergreen tree?
- Maintains its leaves all year long.

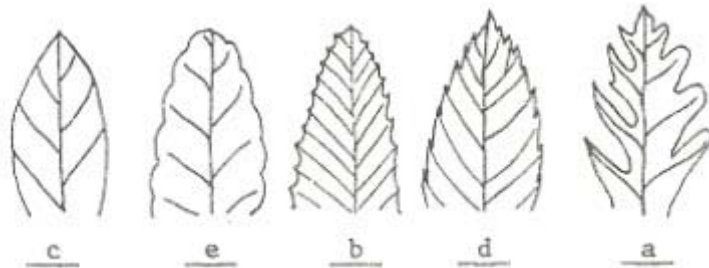
15. Identify the following common leaf forms by placing the correct letter under the item.

- a. Oval
- b. Awl-like
- c. Ovate
- d. Elliptical
- e. Obovate
- f. Oblong
- g. Lancelate
- h. Linear
- i. Cordate



16. Identify the following leaf margins by placing the appropriate letter under the different leaves.

- a. Lobed
- b. Dentate
- c. Entire
- d. Serrate
- e. Sinuate



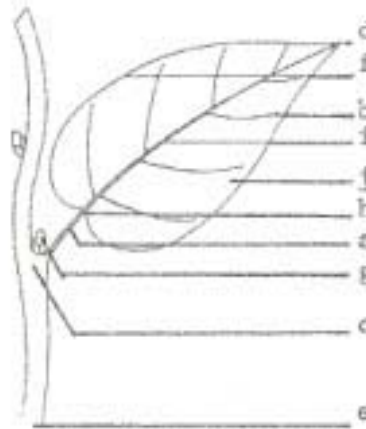
17. Identify the following leaf arrangements by placing the correct letter in the appropriate blank.

- a. Opposite
- b. Whorled
- c. Alternate



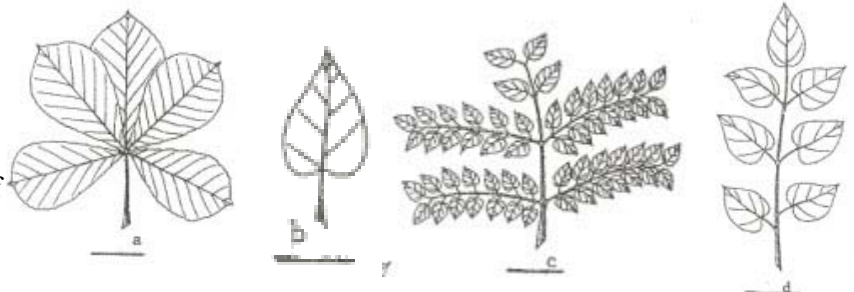
18. Identify the following leaf characteristics by placing the correct letter at the end of the appropriate blank.

- a. Petiole
- b. Lateral veins
- c. Node
- d. Tip
- e. Stem
- f. Margin
- g. Axillary bud
- h. Leaf base
- i. Primary vein
- j. Blade or lamina



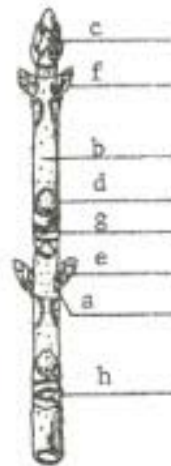
19. Identify the following leaf compositions by placing the correct letter in the appropriate blank.

- a. Palmately compound leaf
- b. Simple leaf
- c. Bi-Pinnately compound leaf
- d. Pinnately compound leaf



20. Identify the following twig characteristics by placing the correct letter in the appropriate blank.

- a. Node
- b. Lenticel
- c. Terminal Bud
- d. Leaf Scar
- e. Lateral Bud
- f. Bud Scale
- g. Vascular Bundle Scar
- h. Ring of Bud Scale Scar



## TREE PHYSIOLOGY

1.     What is heartwood?  
        The center portion of the tree which is composed of dead wood. It serves only to give strength to the tree.
2.     What is the function of the outer bark?  
        It protects the tree from injury.
3.     What is phloem?  
        The inner bark of the tree that carries food made in the leaves down to the branches, trunks and roots.
4.     What is the cambium?  
        The layer of cells where growth occurs. It builds tissues, wood inside and bark outside, and forms an annual ring each year.
5.     What is xylem?  
        The sapwood that carries water and minerals absorbed by the roots to the leaves.
6.     What is the most important part of the tree?  
        The root system.
7.     What are annual rings?  
        The growth layer of one year as viewed on the cross-section of a stem, branch or root.
8.     What do closely spaced annual rings signify?  
        Slow growth.
9.     What is the only living part of a tree trunk?  
        The cambium.
10.    What is photosynthesis?  
        The process by which sunlight is converted into energy.
11.    What is chlorophyll?  
        The green coloring matter in plants necessary for photosynthesis.
12.    What is springwood?  
        The less dense, larger-celled, first formed part of growth layer. It is lighter in color and generally wider than summerwood.
13.    What are the methods of reproducing forest trees?  
        Sprouts, suckers, seeds.
14.    What are sprouts?  
        Young plants growing from the base or from the stump of a tree.

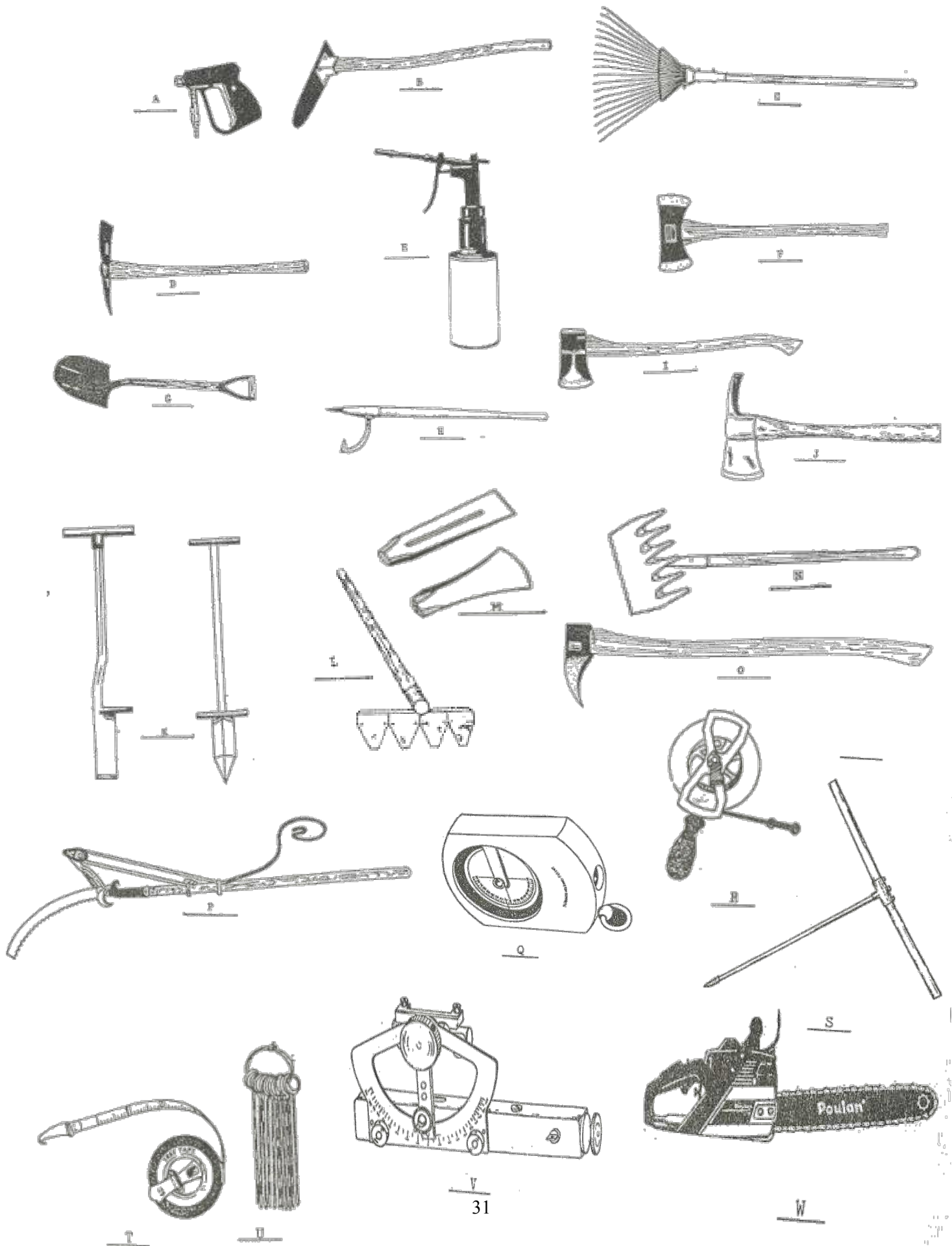
15. What are suckers?  
Shoots that are produced from underground roots.
16. What is transpiration?  
The process by which water vapor leaves a living plant and enters the atmosphere.
17. What is respiration?  
The process by which carbon dioxide enters a living plant and oxygen is released to the atmosphere.
18. What is an ovary?  
The part of the female reproductive system of a plant, the flower, which contains the ovule.
19. What is a stamen?  
The male part of the reproductive system of a plant that contains the pollen.
20. What is the function of a leaf?  
To manufacture food through photosynthesis.
21. What is the function of the flower?  
To produce a fruit which produces the seed.

## INSTRUMENTS AND EQUIPMENT

1.     What is a hypsometer?  
        An instrument used for measuring heights of trees.
2.     What is a clinometer?  
        An instrument used for measuring height of slope.
3.     What is an Abney level?  
        A hand surveying instrument that measures elevation or depression angles and can be used to measure tree height.
4.     What is a Merritt hypsometer?  
        Height measuring instrument consisting of a series of graduations (usually in 16-foot logs or half-logs) placed on one side of a Biltmore stick.
5.     What is an altimeter?  
        Height measuring device.
6.     What is a dendrometer?  
        An instrument used to measure tree diameter at a distance from the tree (examples: Wheeler Pentaprism, Relaskop). They are usually used to measure diameters a distance from the ground (top diameters).
7.     What are calipers?  
        An instrument used to measure tree diameters or logs. It consists of a graduated rule with two arms, one fixed at right angles to one end of the rule, the other sliding parallel to the fixed arm.
8.     What is a diameter tape?  
        A tape for measuring tree diameters directly; it is calibrated so that the measurement of the tree's diameter is read directly from the tape although the circumference is actually measured. The diameter tape is very accurate.
9.     What is a Biltmore stick?  
        A straight rule held horizontally at arm's reach (25") against a tree so that the zero end lies tangent to one side of the tree. The diameter is measured by reading the scale on the stick on the other side of the tree. It gives approximate values.
10.    What is a stereoscope?  
        An instrument that allows a viewer to see a three-dimensional model when viewing two separate images of the same terrain.
11.    What is a prism?  
        A wedge-shaped glass instrument that, through displacement, aids in the measurement of a basal area.

12. What is an increment borer?  
An auger-like instrument with a hollow bit. The increment borer is used to extract cores from trees so growth and age can be determined.
13. What is a surveyor's chain?  
A steel tape calibrated in chains (66 feet) and links (100 links per chain).
14. What is a compass?  
An instrument used to determine direction.
15. What is the difference between azimuth and bearing?  
An azimuth is the clockwise angle from north to the line in question. An azimuth can fall anywhere between 0° to 360°. A bearing cannot be greater than 90°. It is the angle from either the north line or the south line, whichever is smaller.
16. What is a drip torch?  
A tool used in prescribed burning and fire control. It consists of a fuel supply tank and a tube with a drip nozzle in the end that can be lighted.
17. What is a dibble?  
A metal tool used to make a hole for planting pine seedlings.
18. Identify the following tools by placing the letter of the tool in the appropriate blank.

A.	Spotgun Applicator	M.	Splitting Wedge
B.	Hoe	N.	McLeod Rake
C.	Firebroom Rake	O.	Hooker
D.	Pick	P.	Pruning Saw
E.	Tree Marking Gun	Q.	Clinometers
F.	Double Bit Ax	R.	Steel Tape
G.	Round-nose Shovel	S.	Increment Borer
H.	Peavey	T.	Tree Diameter Tape
I.	Single Bit Ax	U.	Pins
J.	Pulaski	V.	Abney Level
K.	Planting Bars	W.	Chainsaw
L.	Council Rake		



19. What is a pruning saw?  
A tool used to remove branches from trees which are larger than 1 ¼” in diameter.
20. What is a planting bar?  
A tool which cuts into the soil for setting seedlings and placing fertilizer pellets into the soil.
21. What are wedges?  
Tools inserted into wood behind a chain saw to keep saw blades from being pinched in a cut; used to start a tree falling in right direction.
22. What is an ax?  
A tool used in logging for cutting small brush, for driving wedges, for chopping out a saw struck in a cut; used in fire fighting for cutting limbs and small trees to remove potential fuel from a fire.
23. What is a hooker?  
A tool used to move pulpwood logs into position on logging trucks.
24. What is a peavey and canthook?  
A tool used for rolling logs.
25. What is a shovel?  
A tool used for digging and lifting loose sand and soil.
26. What is a rake?  
A tool used to remove leaves and twigs to clear fire break.
27. What is a firebroom rake?  
A rake used for clearing light litter.
28. What is a McLeod rake?  
A rake used for clearing matted leaves and loose debris.
29. What is a council rake?  
A rake used for digging; cutting grass, small brush or saplings; or rolling burning logs.
30. What is a hoe?  
A tool used to plant tree seedlings on slopes or in hilly terrain.
31. What is a pick?  
A tool used for digging in hard surfaces.
32. What is a Pulaski?  
A combination ax and pick used in cutting firelines.
33. What is a spotgun applicator?  
A spray gun used to spray herbicide; used with a backpack pressure spray tank.



34. What is a tree-marking gun?  
A spray gun used to spray a spot of paint on trees to be cut or left uncut.
35. What are chaining pins?  
Pins used to mark out chain lengths or shorter lengths while measuring a longer distance.
36. What is a steel tape?  
A tape designed especially for precise measuring such as route surveys highways and railways, mining and forestry surveying work.
37. What is a chainsaw?  
A piece of equipment used for felling timber, delimbing, and bucking logs.

## MEASUREMENTS AND MAPPING

1. How many square feet are in one acre?

43,560

2. How many feet are in one rod?

16.5

3. How many rods are in one chain?

4

4. How many feet are in one chain?

66

5. How many square chains in one acre?

10

6. How many square miles in one section?

1

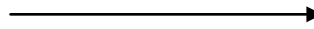
7. How many acres are in one section?

640

8. How many sections are in one township?

36

9. How are townships numbered?



6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

10. What is a meridian?

A fixed line of reference running north and south from a baseline.

11. What two major principle meridians are in Alabama?

- St. Stephens
- Huntsville

12. What are the two major types of land surveying?

- Metes and bounds
- Rectangular

13. What is a cord?

128 cubic feet of wood, bark and air.

4'x4'x8'

A common unit of measure for pulpwood.

MEASUREMENTS OF MAPPING	
43,560 square feet = 1 acre	
16.5 feet = 1 rod	
4 rods = 1 chain	
1 chain = 66 feet	
10 square chains = 1 acre	
Section = 1 square mile	
One section = 640 acres	
Township = 36 sections	

14. What is a board foot?  
A unit of measure represented by a board 12 inches long X 12 inches wide X 1 inch thick.
15. What is MBF?  
One thousand board feet – the common unit of measure for sawtimber.
16. What method do foresters use to count trees when cruising?  
Dot tally system.
17. What is DBH?  
Diameter at breast height. The point on a tree 4.5 feet from the ground (on the upslope side), where diameter is measured.
18. What type of map shows the shape or lay of the land?  
Topographic maps.
19. What are two types of map scales?  
Natural – no units are involved (example: 1:660)  
Artificial – comparison of different units (example: 8 inches = 1 mile)
20. What is a contour line?  
On a topographic map, a line along which elevation is the same.
21. What is a contour interval?  
The vertical distance between contour lines.
22. On topographic maps, in which direction do contour line V's point?  
Uphill or upstream.
23. On topographic maps, contour lines U's point in what direction?  
Downhill.
24. On topographic maps, boundaries and monuments are shown in what color?  
Red.
25. On topographic maps, landmarks and roads are shown in what color?  
Black.
26. On topographic maps, streams are shown in what color?  
Blue.
27. On topographic maps, open lands are shown in what color?  
White.

28. On topographic maps, forested lands are shown in what color?  
Green.
29. How is sawtimber sold?  
Cord or board feet.
30. What is meant by merchantable height?  
The length of the tree stem from the top of the stump to the smallest part of the tree top that can be sold.
31. Total tree height is generally measured to the nearest \_\_\_\_\_.  
10-foot interval.
32. How can tree height be measured?  
With a tree scale stick, Abney level, or any other height measuring device.
33. Pine sawtimber trees generally have a minimum d.b.h. of how many inches?  
9
34. What must you know to estimate board foot volume of sawtimber?  
  - d.b.h. to the nearest inch
  - Merchantable height to the nearest one-half 16-foot log
  - The prevailing log scale
35. How is the volume of lumber in logs determined?  
To measure volume of logs, sawlogs are measured at the small end of the log by placing the stick across the average diameter. Volume for different diameters and lengths from 8 to 16 feet are shown on the flat side of the stick marked "Log Scale Stick," Logs over 16 feet long are scaled as two logs allowing for taper on logs 22 feet or longer.
36. Write the correct section numbers for the sections marked.

a. 3

b. 8

c. 30

d. 31

e. 36

			a		
	b				
c					
d					e

## FOREST INSECTS AND DISEASES

1. What is forest entomology?  
The study of forest insects
2. What are the three most important bark beetles attacking pines in the South.
  - Southern Pine Beetle
  - Black Turpentine Beetle
  - Lps Engraver Beetle
3. What is the most destructive forest pest, in terms of damage, in Alabama?  
Southern Pine Beetle
4. In Alabama, which causes more damage to timber: wildlife or insects?  
Insects
5. What do defoliators eat?  
The leaves of trees
6. What are two examples of a defoliater?
  - Forest Tent Caterpillars
  - Pine Sawfly
7. What is forest pathology?  
The study of forest tree diseases
8. What disease is indicated by the presence of fungus-fruiting bodies at the base of a pine tree?  
Annonsus Root Rot
9. What disease is common in shortleaf pines?  
Littleleaf Disease
10. What disease is prevented by prescribe burning young longleaf stands?  
Brown Spot
11. What are the signs of attack of the Southern Pine Beetle?  
  
The first indication of attack is usually the yellowing or browning of the needles. Examination of the trunk of the tree will usually reveal white, yellow, or sometimes red-brown patch tubes, about as large as a wad of gum. Initial beetle attacks are in the mid-trunk area and then up and down the length of the tree. The adult beetles bore through the bark and then excavate long winding "S" shaped galleries.

12. What are the signs of attack of the Ips Bark Beetle?  
Trees usually have numerous white to reddish brown pitch tubes, about the size of a wad of gum, on the bark of the branches or trunk. The adult beetles chew round holes through the outer bark of the cambium layer. The Y or H shaped egg tunnels are made in the soft inner bark parallel with the grain of wood, and are generally free of boring dust.
13. What are the signs of attack of the Black Turpentine Beetle?  
The most obvious signs of attack are conspicuous pitch tubes on the lower trunk and stumps. They bore into the tree to the cambium layer and there excavate a broad vertical gallery. The larvae destroy large patches of the cambium area.
14. Describe the damage caused by Brown Spot Needle Disease.  
Damage is caused to the needles resulting in defoliation and subsequent death of the seedlings.
15. Describe the damage caused by Littleleaf Disease.  
The destruction of the growing tips of the roots by the soil fungus. Affected trees have a sickly appearance, generally decline slowly, and die prematurely. In the early stages of the disease, the foliage may display a slight yellowing and the current year's needles may be shorter than normal.
16. Describe the damage caused by Annosus Root Rot Disease.  
Usually the first indication that the disease is present is dead and dying trees in a stand that has been thinned in the past year or two. The infected area may be composed of dead trees with and without needles, trees with chlorotic foliage, and trees with completely healthy appearing needles.
17. What are the normal first sign(s) of attack of the forest tent caterpillar?  
The appearance of many defoliated trees
18. What are the signs of Fusiform Rust?  
Bright orange spots on a pine tree trunk.
19. What is the most common disease affecting longleaf pine in Alabama?  
Brown Spot
20. Southern pine beetle infestations are frequently preceded by what?  
Extended drought conditions
21. What is the most serious cause of mortality in Alabama forests?  
Insects and Disease
22. What is the major damage caused to coniferous trees by the Nantucket pine tip moth?  
Damage to terminals and leaders of pine seedlings and saplings

## UTILIZATION

1. What is log rule?  
A table showing the estimated or calculated amount of lumber which can be sawed from logs of given length and diameter
2. What are the three most important log rules in Alabama?
  - Doyle
  - Scribner
  - International 1/4"
3. What is kerf?  
The width of a cut made by a saw
4. What are the four most common product classifications?
  - Poles & piling
  - Veneer
  - Sawtimber
  - Pulpwood
5. What is scaling diameter?  
The measurement of the small end, inside of the bark, of a log
6. What is a catface?  
A scar on the surface of a log resulting from wounds that have not healed over
7. What is the purpose of written sales agreements?  
Prevents misunderstandings and protects both the buyer and the seller.
8. List six items that should be considered when preparing a timber sales contract.
  - Provisions that specify the amount, manner, time, and method of payment
  - If selling by the unit, use a standard and well defined wood measurement, such as MBF, cord, or ton
  - A legal description of the property
  - A description of the timber being sold, its location and marking method
  - Cutting rules and regulations
  - Provisions for settling disagreements

## WILDLIFE

1. What four things do all wildlife need in order to survive?
  - Food
  - Water
  - Cover
  - Space
2. What is another name for a small flock or group, often a family of birds, such as quail?  
Covey
3. What is carrying capacity?  
A wildlife management term frequently expressed as a number indicating the population of any given animal a given area can support
4. What is the process of identifying and counting animals?  
Inventory
5. What is bag limit?  
The maximum number of animals allowed to be taken by an individual in regulated fishing or hunting
6. What is predation?  
The act of preying upon
7. What are resident wildlife?  
Animals which do not migrate
8. What is the agency that regulates hunting and fishing in Alabama?  
The Alabama Department of Conservation and Natural Resources
9. What are edges?  
Transitional zones where two eco-types interface
10. What are some examples of mast producing trees?
  - Dogwood
  - Oak
  - Holly
  - Maple
  - Blackgum
  - Mulberry
  - Beech
  - Black Cherry
  - Sweetgum



11. What is one of the most beneficial and inexpensive tools used for wildlife management?  
Fire (prescribed burning)
12. What spacing is required for sawtooth oaks planted as wildlife food?  
25 feet apart in rows of 20-25 feet wide.
13. What is a tuber producing plant that is widely planted for deer and turkey?  
Chufa
14. What perennial legume is planted primarily for bobwhite quail?  
Lespedeza bicolor
15. What are dead trees that are purposefully left to provide habitat for wildlife?  
Snags or den trees
16. Different types of animals need different types of what?
  - Food sources
  - Cover
17. What can be used to create two types of habitat for small animal and reptiles?
  - Brush piles
  - Rock piles
18. What percentage of hardwood tree species must be maintained for squirrel management?  
20
19. What are some species that thrive in the excellent habitat provided by clearcuts in their early stages?
  - Deer
  - Quail
  - Rodents
  - Seed-eating birds

## FIRE

1. What is a groundfire?  
A fire that consumes not only all the organic materials of the forest floor but also burns into the underlying soil itself, for example, peat fire
2. What is a crown fire?  
A fire which runs through the tops of living trees
3. What is a surface fire?  
A fire which runs over the forest floor and burns only the surface litter, loose debris and smaller vegetation
4. What is a wildfire?  
A fire burning out of control
5. What is prescribed burning?  
The application of fire to land under such conditions of weather, soil moisture, time of day and other factors as presumably will result in the intensity of heat and spread required to accomplish specific silvicultural, wildlife, grazing or fire hazard reduction purposes.
6. What are the three elements necessary for fire (the fire triangle)?  
Heat, oxygen, fuel
7. What is backfire?  
A fire set along a natural or artificial firebreak and permitted to spread into the main fire or any fire spreading against the wind.
8. What is duff?  
Forest litter and other organic debris on top of mineral soil
9. What is slash?  
Branches, bark and other debris left on site after logging
10. Who do you call to obtain a burn permit?  
The Alabama Forestry Commission
11. What is the main cause of fire in Alabama?  
Incendiary
12. How deep should a fireline be to stop burning?  
To mineral soil
13. How often should a pine stand be prescribed burned in order to reduce fuels?

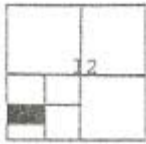
- Every 3 to 5 years
14. What size should pines be before being burned?  
DBH 4 inches or larger
  15. What is the most fire resistant tree grown in Alabama?  
Longleaf pine
  16. What are firebreaks?  
Firebreaks are strips of land cleared of all inflammable material
  17. What considerations should be observed in preparing firebreaks?
    - They should generally follow the contour of the land
    - They should not cross ponds or drainage systems
    - They should be laid out in a way to avoid large trees and other obstacles
  18. What is “direct attack?”  
A method of fire control used when fires are not too intense and are moving slowly. The fire is attacked at the furthestmost point of advance or the “head” of the fire. Burning material is raked back into the burned area.
  19. What is “indirect attack?”  
A method of fire control where fuels are removed from the immediate vicinity of the fire line. It is used where the rate of spread is slow, but the fuels are deep. A firebreak is constructed in the path of the fire by removing all fuels down to bare mineral soil. A series of firebreaks are plowed across head of fire to give sufficient width to prevent the fire from crossing.
  20. What is a spot fire?  
A fire started when sparks from the main fire ignite a new fire
  21. What is duff?  
Forest litter and other organic debris in various stages of decomposition on the forest floor
  22. What is mineral soil?  
Soil that contains nothing that will burn
  23. Why are hardwoods sensitive to fire?  
Their bark is relatively thin
  24. How can fire influence site preparation?  
By removing forest litter
  25. How can fire influence wildlife habitat?

Burning will increase the yield and quality of herbage, legumes, and browse from hardwood sprouts and create openings for feeding, travel, and dusting.

- 26. How does prescribed burning affect disease control?  
Destroys fungus and other disease organisms
- 27. When is the best season of the year for burning?  
Either summer or winter

## SAMPLE PROBLEMS

- What is the legal description of the shaded land area? It is located in Township 10N, Range 20E.



N  $\frac{1}{2}$  of the SW  $\frac{1}{4}$  of the SW  $\frac{1}{4}$  of Section 12, Township 10 North, Range 20 East.

- How many acres are in the tract of land described in Sample Problem Number 1 above?  
20

- What acreage is in a  $\frac{1}{10}$  acre plot?  
0.1

- Using the dot tally system, how many trees have been tallied?

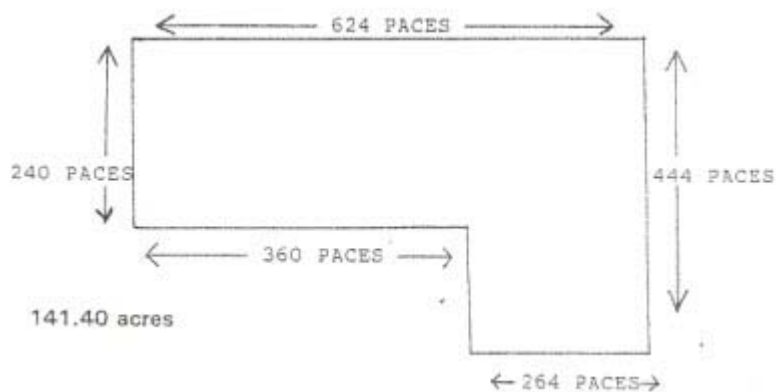


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- How would you tally 5 trees?

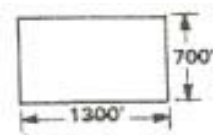


- Mr. Jones paced an area to get an acreage estimate. Mr. Jones' pace is 12 paces per chain. What is the acreage of the tract mapped below?



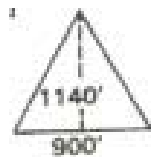
- Planting trees on an 8 x 10 spacing, how many seedlings would be planted per acre?  
545
- How many trees, planting on an 8 x 10 spacing, would be planted on 40 acres?  
21,800

9. How many board feet are in a board measuring 12" x 12" x 18'?  
216
10. How many  $\frac{1}{4}$  acre plots will a forester measure on a 10% cruise of 100 acres?  
40
11. How many tenth-acre plots will a forester measure on a 10% cruise of 100 acres?  
100
12. On a 7  $\frac{1}{2}$  minute series topographic map, what does a scale of 1:24,000 mean?  
1 inch = 2000 feet.
13. A township is 36 miles square. How many acres does a township contain?  
23,040
14. A man has a rectangular forest plot that measures 700 feet by 1,300 feet. How many acres are in this plot?  
20.89

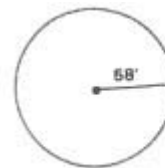


15. Mr. Jones has a triangular region in a field that he is setting out in pines. The measurements are as follows: base 900 feet and height 1,140 feet. How many acres are in the plot?

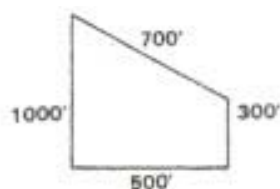
11.77



16. Determine the area of a circle plot that has a radius of 58 feet.  
10,562.96 sq. ft.



17. How many acres are in this plot?  
7.46



18. If there are 24 boards of the following dimensions, how many board feet are there (length – 10'; width – 4"; thickness – 2")?

160

19. What is the total cost of 10 pieces of 2 x 4s x 12' @ \$.85/ft.?

\$68.00

20. What is the total cost of 4- 1 x 12s x 14' @ \$.92/ft.?

\$61.52

21. How many cords in a stack of wood with these measurements: length of stack – 10'; width of stack – 8'; and height of stack – 8'?

5

What is the value of the firewood @ \$95.00/cord?

\$475.00

22. How many cords of pine pulpwood would be on a truck bed with the following measurements: length of stack – 24'; width of stack – 5.5'; and heights of stacks – 12', 14', 16', 8', and 10'?

12.38

23. Pine seedlings cost \$27.50/M. What would be the cost of planting 3,000 seedlings?

\$82.50

24. Virginia pine seedlings cost \$25.00/M from the state nursery. Shipping costs are \$3.00 per thousand. How many seedlings would be needed to plant 6 acres using a 5' x 7' spacing?

7,467

What would be the total cost including shipping?

\$209.08

25. John Smith purchased 900 acres of cutover land. He plants 400 acres in Loblolly Pine. What percent of his land is planted in Loblolly Pine?

44.44