Louisiana Examination of Advanced forestry

9-19-2018 Stuart Lake, Kisatchie National Forest

Test validated and monitored by Robbie Hutchins LSU Agcenter Extension Agent ANR
and Joshua Adams, Ph.D. Louisiana Tech Forestry

Name KEY

School ________________________________

Louisiana Ag-Tech Certificate number ___________________________

Qualifying CDE date_____________________________

**Notes:**
Merchantable heights are estimated to the upper point on a tree where it becomes 10 inches in diameter, OR, where a major fork in a tree stem occurs, OR, where a limb or cluster of limbs have a combined diameter equal to ½ of the diameter of the tree at that point. These upper limit rules are called “stoppers”.

When figuring tree volumes, all trees are considered sound for the purpose of this exercise (no cull deductions).

Measure the tree diameters in 1-inch diameter classes
Measure merchantable tree heights in 16-foot logs (to the nearest ½ log) Assume no declination (0*) when using compasses
Needed Equipment: Logger tape, clinometer, compass, calculator, and volume table. Use the tree volume table provided.

Each question is worth 1 point unless otherwise noted.
A. Tree Study, Mensuration, Insects/Disorders, Wood Products Manufacturing

1) Identify this tree. (2 points) **Longleaf**

2) What is the diameter of this tree (2 points)? **19”**

3) What is the merchantable height? **4 logs**

4) What is the board foot volume? (3 points) **324**

5) Name at least two damages/disorders on this tree (2 points). **fire, mechanical, cicada**

6) Name a manufactured wood product made from this tree. **Lumber, plywood, poles, pulp, paper, wood pellets. Byproducts: turpentine, ink, paint**

B. Tree Study, Mensuration, Wood Products Manufacturing

7) Identify this tree. (2 points) **Southern Red Oak**

8) What is the diameter of this tree? **18”**

9) What is the merchantable height? **2 logs**

10) What is the board foot volume? (3 points) **179**

11) Name a manufactured wood product made from this tree. **Flooring, pallets, cabinets, trim, veneer, furniture**

C. Tree Study, Mensuration, Wood Products Manufacturing

12) Identify this tree. (2 points) **Loblolly Pine**

13) What is the diameter of this tree (2 points)? **18”**

14) What is the merchantable height? **4 logs**

15) What is the board foot volume? (3 points) **273**

16) Name 3 wood products made from this tree (3 points). **Wood chips, paper, pulp, lumber, veneer, plywood, trim, stakes, OSB, particle board, wood pellets**

17) Name a manufacturer in Louisiana that utilizes this species for paper production. **International Paper, West Rock, Weyerhauser, Georgia Pacific, Graphic Packaging, Packaging Corp. of America, KPAQ**
18) Name a manufacturer in Louisiana that utilizes this species for plywood production.
    Roy O Martin, Boise Cascade, Hunt, Weyerhauser.

D. Tree Study, Wood Products, Insects/Disorders

19) Identify this tree. (2 points) Ash (white)
20) Name two products made from this tree (2 points)? Baseball bats, furniture, flooring, pool sticks, hockey sticks, tool handles
21) Circle the type of leaf this tree has. A. Simple  B. Pinnate  C. Palmate
22) Which invasive insect currently threatens the future of this tree species? Emerald Ash Borer

E. Tree Study, Insects/Disorders, Forest ecology

23) Identify this tree. (2 points) Maple (red)
24) What disorder does this tree have? Heart rot, butt rot, mechanical damage
25) What characteristic allows this species to grow in the understory of this forest?
    Phototrophic broadleaf that is able to capture filtered sunlight effectively.

F. Tree Study and Mensuration

26) Identify this tree. (2 points) Loblolly Pine
27) What is the diameter of this tree? 27"
28) What is the merchantable height? 4 logs
29) What is the board foot volume? (3 points) 877
30) What health issue does this tree have? Bored holes from wildlife (woodpecker)

G. Tree Study, Mensuration, Forest products

31) Identify this tree. (2 points) Sweetgum
32) What is the diameter of this tree? 13"
33) What is the merchantable height? 1 log
34) What is the board foot volume? (3 points) 42
35) Name a manufactured wood product made from this tree. Veneer, plywood, furniture (speaker/acoustic cabinets), interior trim, boxes/crates, and turned objects.

36) Name two types of deer browse within a chain of this tree (2 points) wild grape (muscadine), French mulberry, green briar.

H. Tree Study, Wood Products, Silviculture Practices

37) Identify this tree. (2 points) **White Oak**

38) Name a product that is made from this tree?  Cabinetry, furniture, interior trim, flooring, boatbuilding, barrels, and veneer.

39) Circle the leaf type that best describes this species leaves.
   A. entire       B. palmately compound       C. pinnately compound   D. Lobed

40) Is this tree inside a stream management zone? **No**

41) According to Louisiana’s BMP guide, how wide should an SMZ be for a perennial stream that is less than 20 feet wide? **50’**

I. Land Measurement. Use the topo map to answer these questions:

42) What is the Scale of this USGS Topography Map? **1:24,000**

43) What is the Contour Interval of this USGS Topography Map? **5 feet**

44) How many acres are forested in S28, T14N, R11E? **160**

45) What is the highest elevation in S5, T13N, R11E? **75’**

46) What two state routes meet East of Dearborn in S28, T14N, R12E (2 points)? **888, 575**

J. Silviculture practices, Harvesting, Reforestation (stocking)

47)  A. What is this tool? **Wedge Prism** (10 factor)

   Use the tool to take a reading at the point marked by the stake.

   B. What is the basal area of this plot? **160** (3 points)
K. Wood products, Paper and pulp products

48) Identify the tree this wood sample came from Red Cedar

49) Identify the tree this wood sample came from Red Oak

50) Identify the tree this wood product (axe handle) came from Hickory

51) Identify the tree this wood product (stake) came from yellow pine

52) What are the layers of this plywood called? veneer

53) Name a finished product made from this brown Kraft paper? Cardboard, packaging, corrugated liner.

L. Forest Ecology

For question 53, refer to the print out of the Arcgis screen “Canopy Cover” from https://www.arcgis.com/home/item.html?id=71b23b15e9ad439d9b9a9e135b825fed

54) Which quadrant of the Tonto National forest has the largest timber? NE

For question 54, use printout C-CAP Class Name

55) Which type of forest are we currently working in? mixed forest

M. Land Measurement, Silviculture Practices

Refer to the two stakes

56) Along what azimuth does the marked “boundary” line extend? (3 points) 139

57) How many feet is this leg of the boundary? (3 points) 57’

58) What is the slope between the two stakes? (3 points) +13%

N. Land Measurement, Silviculture Practices

Refer the two stakes

59) Along what azimuth does this line of the boundary extend? (2 points) 242

60) How many feet is this leg of the boundary? (3 points) 63’

61) What is the slope of the land between the stakes (3 points) -8%
O. Silviculture Practices, Harvesting, Safety

62) Identify this cut. Face cut/notch (was a humbolt notch). What is the purpose of making this cut when felling a tree with a chainsaw? Strategic felling, direction.

63) Identify this cut. Back cut/felling cut. What is the purpose of making this cut when felling a tree? To fell the tree while leaving enough wood on the stump to guide it in the intended direction.

64) What is the wood called in this area between the two cuts? Hinge/holding wood.

65) When processing these lay downs with a chainsaw, which area should be cut first?

Area B Why? Area B is safer than area A. Area A is a pinch point for the saw. There is no pressure on area B.

P. Fire in the forest

66) Explain the benefits of prescribed fire as a management tool. (3 points)

- Safely reducing excessive amounts of brush, shrubs and trees.
- Encouraging the new growth of native vegetation.
- Maintaining the many plant and animal species whose habitats depend on periodic fire.

67) What are two purposes for a dozer line surrounding a prescribed burn (2 points)

- Sets a perimeter, creates access, prevents spreading to adjacent property.

Q. Job Seeking Skills

68) About how many forestry related jobs are there in Louisiana? 45,000-46,000 accepted.

69) How many primary wood using industries (sawmills, paper mills, plywood plants etc.) are in Louisiana? 150.

70) How many secondary wood using industries (cabinet makers, furniture manufacturers etc.) are in Louisiana? 720.

71) Name two Universities in Louisiana with degrees in forestry (2 points). LSU, Southern, LA Tech.
72) Name two characteristics all entry level employees should demonstrate to their employer (2 points). Various answer accepted.

73) What town has a community college campus in Louisiana with a 2 year degree in forestry Winnfield or Oakdale

Business Problem
Mrs. Jones has 40 acres of timber you would like to purchase. Figure out how much you can offer Mrs. Jones for her timber while making a 20% profit over expenses. This problem does not consider taxes or insurance costs.

<table>
<thead>
<tr>
<th>Species</th>
<th>Total Volume (bd ft) on the 40 acres (not per acre)</th>
<th>Price Delivered to Mill ($/1,000 bd ft)</th>
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</thead>
<tbody>
<tr>
<td>Southern Pine</td>
<td>100,000</td>
<td>$250/1000 Board feet</td>
</tr>
<tr>
<td>Red Oak</td>
<td>25,000</td>
<td>$400/1000 Board feet</td>
</tr>
<tr>
<td>Sweet gum</td>
<td>20,000</td>
<td>$150/1000 Board feet</td>
</tr>
<tr>
<td>White Oak</td>
<td>20,000</td>
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</tr>
<tr>
<td>Cherry</td>
<td>2,000</td>
<td>$800/1000 Board feet</td>
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In this area it costs $150 per thousand to operate your logging crew (stump to log deck), $50 per thousand to haul to the mill, and $100 per acre to retire your roads, trails and landings.

74) What is your total logging crew cost (stump to log deck)? \$25,050

\[ \$150/1000 \times 167,000 \]
\[ \$150 \times 167 = \$25,050 \]

75) What is your total hauling cost? \$8,350

\[ \$50/1000 \times 167,000 \]
\[ \$50 \times 167 = \$8,350 \]

76) What is your total site retirement cost? \$4,000

\[ \text{40 acres} \times \$100/\text{acre} \]
\[ \text{40} \times 100 = \$4,000 \]

77) What are your total costs? \$37,400

\[ \$25,050 + \$8,350 + \$4,000 = \$37,400 \]
78) What will you get by the mill for all 40 acres of timber delivered? $47,600

$25,000 + $10,000 + $3,000 + $8,000 + $1,600 = $47,600

Southern pine 100,000 x $250/1000
100,000 x $250/1000
$25,000

Red Oak 25,000 x $400/1000
25,000 x $400/1000
$10,000

Sweet gum 25,000 x $150/1000
25,000 x $150/1000
$3,000

White Oak 20,000 x $400/1000
20,000 x $400/1000
$8,000

Cherry 2,000 x $800/1000
2,000 x $800/1000
$1,600

79) What is your profit margin? 21.4%

Profit is Total revenue minus cost $47,600 - $37,400 = $10,200

Profit margin = divide profit ($10,200) by total revenue ($47,600) and express it as percentages.

$10,200/$47,600 = .21428571

.21428571 x 100 = 21.4 %
## Doyle Log Rule

### Volume (Board Feet) by Number of 16 Foot Logs

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