

## Forest Ecology

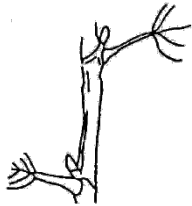
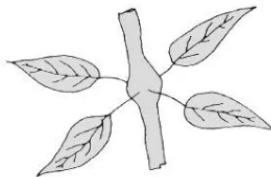
Test Total: \_\_\_\_\_ / 50 points

## Part 1. Tree Identification

1. Using the plant samples on the table, write the correct species of each tree or shrub using both the common and scientific names. Spelling and capitalization MUST be exact! (6pts | .5pt each)

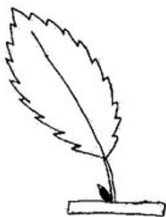
| Specimen ID | Common Name     | Scientific Name              |
|-------------|-----------------|------------------------------|
| a.          | Douglas fir     | <i>Pseudotsuga menziesii</i> |
| b.          | Western hemlock | <i>Tsuga heterophylla</i>    |
| c.          | Ponderosa pine  | <i>Pinus ponderosa</i>       |
| d.          | incense cedar   | <i>Calocedrus decurrens</i>  |
| e.          | Pacific dogwood | <i>Cornus nuttallii</i>      |
| f.          | vine maple      | <i>Acer circinatum</i>       |

2. Dichotomous keys are essential tools for dendrologists. Please label the following common leaf and branching characteristics using the word bank provided. (4pts)

a. alternateb. whirled

## WORD BANK

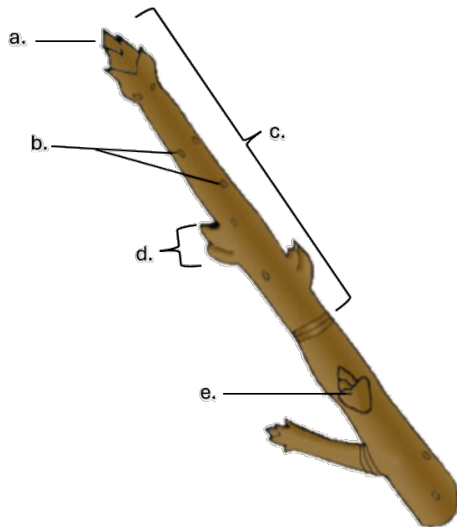
- ☐ compound
- ☐ whirled
- ☐ alternate
- ☐ gapped
- ☐ serrated
- ☐ opposite
- ☐ lobed

c. serratedd. lobed

\_\_\_ / 10 points

## Part 2. Tree Physiology and Forest Ecology

3. Using the diagram below, label the parts of the twig. (5 pts)



### Word Bank:

- ☐ This year's growth
- ☐ Pith
- ☐ Terminal bud
- ☐ Stipule scar
- ☐ Leaf scar
- ☐ Lenticels
- ☐ Lateral bud
- ☐ Node
- ☐ Internode

| Indicator: | Name:              |
|------------|--------------------|
| a.         | Terminal bud       |
| b.         | Lenticels          |
| c.         | This year's growth |
| d.         | Lateral bud        |
| e.         | Leaf scar          |

4. What is the primary function of lenticels on a twig? (1pt)

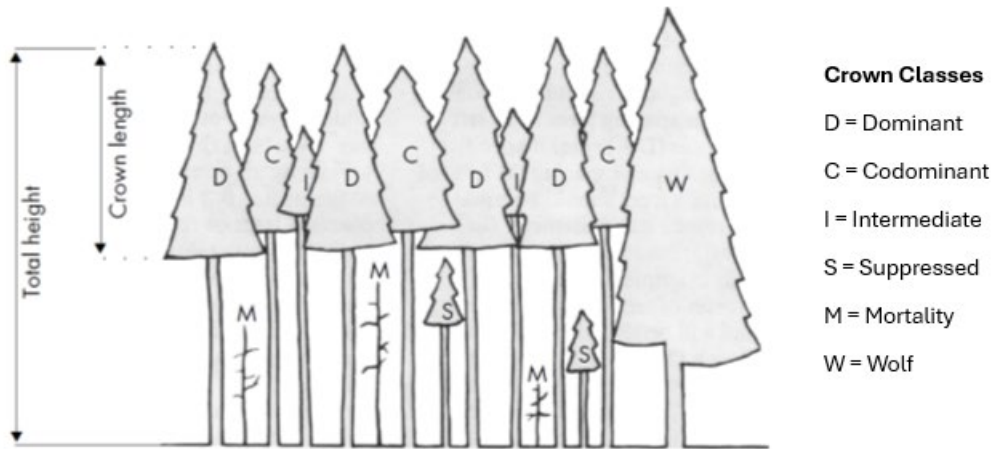
- a) Transporting water and nutrients
- b) Allowing gas exchange
- c) Protecting the bud from drying out
- d) Marking where leaves were attached

5. What does a plant need, besides sunlight, to carry out photosynthesis? (1pt)

- a) Oxygen and Carbon Dioxide
- b) Glucose and Oxygen
- c) Water and Carbon Dioxide
- d) Glucose and Water

\_\_\_ / 7 points

Use the diagram below to answer questions 6-9.



6. Which crown class consists of trees that receive full sunlight from above and the sides? (1pt)

- a) Dominant
- b) Co-dominant
- c) Intermediate
- d) Suppressed

7. Why is crown class important for forest management? (1pt)

- a) It determines which trees will lose their tops in an ice storm
- b) It helps foresters decide which trees to remove in thinning
- c) It indicates the species of a tree
- d) It determines how much water a tree needs

8. What factors should a forester consider when deciding whether to remove or retain a particular tree? (1pt)

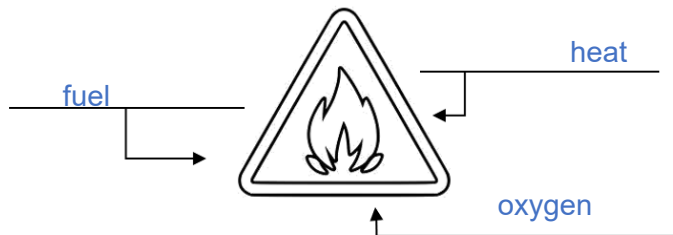
- a) Its impact on timber growth and competition with surrounding trees
- b) Its habitat value for wildlife, such as birds and insects
- c) The tree's overall health and structural condition
- d) The forest management goals for the stand
- e) All of the above

\_\_\_ / 3 points

9. Why might a forester thin a stand by removing intermediate and suppressed trees? (1pt)

- a) To reduce competition and allow dominant and co-dominant trees to grow faster
- b) To lower the risk of wildfire by reducing ladder fuel
- c) To improve overall forest health by increasing air flow and reducing disease risk
- d) All of the above

10. Label the three elements of the fire triangle, which are essential for combustion. (3 pts)



11. What is the primary goal of silviculture? (1pt)

- a) To remove as many trees as possible
- b) To maximize wildlife habitat
- c) To manage forest stands for health, productivity, and sustainability
- d) To prevent any human intervention in forests

12. Clearcutting is a silvicultural method that removes all or most trees from a stand in a single harvest. Under what conditions is clearcutting the most appropriate silvicultural choice? (1pt)

- a) When managing shade-intolerant species that require full sunlight for regeneration, such as Douglas-fir or lodgepole pine.
- b) When the goal is to maintain an uneven-aged forest with multiple canopy layers and crown classes.
- c) When shade-tolerant species, like western hemlock or sugar maple, dominate the stand and require partial shade to regenerate.

13. What role does prescribed fire play in silvicultural management? (1pt)

- a) It eliminates all vegetation permanently
- b) It promotes natural regeneration, reduces competition, and decreases fire risk
- c) It destroys all wildlife habitats
- d) It is only used when no other management options are available

### Part 3. Forest Practices Act & Sustainable Forest Management

Use the resources provided to answer questions 14 -23.

**14. Which of the following is the primary goal of the Oregon Forest Practices Act? (1pt)**

- a) To regulate timber prices and industry profits
- b) To ensure sustainable forestry while protecting soil, water, fish, and wildlife resources
- c) To prohibit all logging on private forestlands
- d) All of the above

**15. Which agency is responsible for enforcing the Oregon Forest Practices Act. (1pt)**

- a) Oregon Department of Energy
- b) Oregon Forest Resources Institute
- c) Oregon Department of Forestry
- d) Oregon Department of State Lands

**16. Which of the following best describes how the Oregon Forest Practices Act has evolved since its passage in 1971? (1pt)**

- a) It has remained unchanged since it was first enacted.
- b) It has been updated multiple times to incorporate new scientific research and environmental protections.
- c) It was repealed and replaced by federal forestry regulations in the 1990s.
- d) It originally applied only to national forests but was later expanded to private lands.

**17. Why are forest management plans important for landowners and forestry professionals? (1pt)**

- a) They provide a structured approach to achieving landowner objectives, such as timber production, wildlife habitat, or recreation.
- b) They help ensure compliance with state and federal regulations, including water quality and wildlife protection laws.
- c) They improve forest resilience by guiding practices like thinning, prescribed burning, and pest management.
- d) All of the above

**18. Oregon is the top U.S. producer of what two forest products? (1 pts | .5pt each)**

Softwood lumber and plywood

19. In adaptive management, if new data suggests improvements to a strategy, the strategy should be modified/adjusted to incorporate new findings and enhance effectiveness. (1pt)
20. Oregon's forests store an estimated 3.2 billion metric tons of carbon. This stored carbon is found throughout the forest in carbon "pools." The pools that store the most carbon are soils and live plants and trees. (1pt | .5pt each)
21. Which of the following is NOT a major voluntary forest certification system operating in Oregon? (1pt)
- a) Sustainable Forestry Initiative (SFI)
  - b) Forest Stewardship Council (FSC)
  - c) American Tree Farm System (ATFS)
  - d) National Park Service Certification (NPSC)
22. Which of these forest certification systems operating in Oregon has the greatest number of acres enrolled? (1pts)
- a) American Tree Farm System
  - b) Forest Stewardship Council
  - c) Sustainable Forestry Initiative
  - d) National Park Service Certification (NPSC)
  - e) They all have the same amount of enrolled acres
23. Why are invasive insect species, such as the emerald ash borer, a growing concern for Oregon forests? (1pt)
- a. They have no natural predators and can rapidly spread
  - b. They only affect a few species and do not impact forest ecosystems
  - c. They are native species that naturally regulate themselves
  - d. They only damage trees that are already dead.
24. What is the primary role of climate models in forest management? (1pt)
- a. To determine the exact weather for the next decade
  - b. To predict long-term trends and inform forest adaptation strategies
  - c. To replace traditional forest stewardship practices
  - d. To encourage clear-cutting in response to climate shifts

\_\_\_ / 6 points

#### Part 4. Biometry & Forest Measurements

There are four trees marked with the letters A, B, C, and D. Using the tool and information specified below, answer the following questions on biometry and forest measurements.

25. Using the Woodland Stick, what is the diameter (DBH) of Tree A? (2pts)

TBD – I need to go measure the exact tree

26. Using a diameter or Loggers tape, what is the diameter (DBH) of Tree B? (2pts)

TBD – I need to go measure the exact tree

27. Using the Woodland Stick, what is the total height of Tree C, given you are 100 feet from the base of the trees? (2pts)

TBD – I need to go measure the exact tree

28. Using a Clinometer, what is the total height of Tree D, given you are 100 feet away from the base of the tree? (2pts)

TBD – I need to go measure the exact tree

29. Using a tree carbon tape, Tree B is storing the carbon equivalence of how many car miles? (1pts)

TBD – I need to go measure the exact tree

\_\_\_\_/ 9 points

**30. What is the age of the tree cookie specimen provided? (1pt)**

TBD – I need to go measure the exact cookie

**31. When using an increment borer to determine a tree's age, where on the tree should you take the core sample? (1pt)**

- a. Near the base of the tree at ground level
- b. At breast height (about 4.5 feet above the ground)
- c. At the very top of the tree
- d. On a branch near the canopy

**32. What is a key feature that helps define a legal property boundary in a forested area? (1pt)**

- a. Fence lines and old logging roads
- b. Tree species composition
- c. Legal descriptions from a deed and survey markers
- d. The presence of a stream or river

\_\_\_ / 3 points