



Use these images for the next 13 questions.

1. (1 point) What family do all of these specimens belong to?

2. (1 point) Give the common and scientific name of A.

3. (1 point) Give the common and scientific name of B.

4. (1 point) Give the common and scientific name of C.

5. (1 point) Which of the images contains a species that is invasive to the United States.

6. (1 point) What is an invasive species?

7. (4 points) Name two things which invasive plant species tend to have in common and explain how they would help an invasive species.

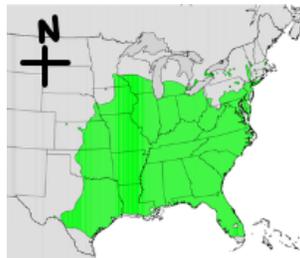
8. (1 point) All of these specimens are dioecious. What does this mean?

9. (1 point) One of these species is also known as bois d'arc. Which specimen belongs to that species?

10. (1 point) Where does the name of bois d'arc come from?

11. (1 point) Knowing that these are dioecious trees, which of the following describes the flowers best?
- A. Incomplete, imperfect
 - B. Complete, imperfect
 - C. Incomplete, perfect
 - D. Complete, perfect
 - E. Not enough information

12. (1 point) This range shows the native range of which of the specimens?



13. (1 point) You live in a city where the average annual minimum winter temperature is 2°F. What USDA hardiness zone do you live in, and which of the species can you plant in your city? Enter the hardiness zone (just give the integer, not a or b) in the first blank and the specimens that can be planted in the zone in the second blank.
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Use this image for the next 11 questions.

14. (1 point) What is the scientific name of this species?
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15. (1 point) What phylum does this species belong in?
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16. (1 point) What is the IUCN conservation status of this species?

17. (1 point) How is the pollen of this species distributed?
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18. (1 point) This species is shade tolerant
A. True B. False

19. (1 point) During which months does this species' pollination occur?

20. (1 point) This species is a softwood. What is softwood?

21. (2 points) Using the internal structure of the wood, explain why wood from trees such as this are softer than trees from other trees such as balsa.

22. (2 points) How is the Janka hardness rating determined?

23. (1 point) Is the Janka hardness rating higher or lower than 1000 lbf?

24. (1 point) What is the Janka hardness rating of this tree? Answer with only the number, do not include the unit (lbf).



Use the images above for the next 16 questions.

25. (1 point) Which of these species is not in the same family as the others?

26. (1 point) What is the common name of this species?

27. (1 point) What is the common family of the other three species?

28. (1 point) What is the scientific name of A?

29. (1 point) What is the scientific name of B?

30. (1 point) What is the scientific name of C?

31. (1 point) What is the scientific name of D?

32. (1 point) What is the leaf arrangement of specimen C?

33. (2 points) Germination in specimen B is epigeal. What does epigeal mean?

34. (2 points) What soil types can Specimen D grow in (use the USDA soil taxonomy)?

35. (1 point) The USS Constitution was constructed from wood from which species?

36. (1 point) All 4 of these species have leaves that are:
- A. Simple
 - B. Pinnately compound
 - C. Palmately compound
 - D. Bipinnately compound

37. (2 points) Define leaf area index (LAI).

38. (1 point) If a mystery forest of 300 square kilometers has an LAI of .5, what is the leaf area? Answer with only the number. Do not include the unit (km^2).

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39. (1 point) Is the Janka hardness rating of specimen B higher or lower than 120?

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40. (1 point) What is the Janka hardness rating of specimen B? Answer with only the number, do not include the unit (lbf).
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Use the images above for the next 10 questions.

41. (1 point) What is the scientific name of A?

42. (1 point) What is the scientific name of B?

43. (2 points) Both of these species are part of a subgenus. What genus are they in, and what is the subgenus? Answer with the genus in the first blank and the subgenus in the second.

44. (1 point) What is the defining characteristic of the subgenus?

45. (1 point) Specimen A is susceptible to infection from *Phytophthora ramorum*. What type of organism is *Phytophthora ramorum*?

46. (1 point) What common tree disease does *Phytophthora ramorum* cause?

47. (1 point) Specimen A also has an ectomycorrhizal relationship. What does this mean?

48. (2 points) What is the other general type of mycorrhizal relationship, and what is the difference between the two?

49. (1 point) What is the native range of specimen B?

50. (2 points) Older trees of the same species as specimen A provide a nesting site to a variety of animals. List two such species.

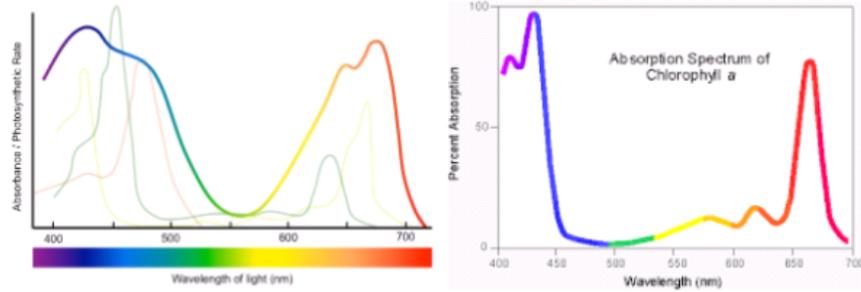
51. (3 points) Starting from the center of the tree, order the following layers of the tree from center to edge.

1. Heartwood
2. Vascular Cambium
3. Phelloderm
4. Sapwood
5. Periderm
6. Secondary Phloem
7. Cork Cambium

52. (2 points) Botanically speaking, what is the bark? What layers of the tree are considered bark?

53. (1 point) What is the name of the special pair of chlorophyll a molecules at the center of PSII?

Use this image for the next 3 questions.



54. (1 point) What is an action spectrum?

55. (1 point) Using the action spectrum above, what is/are the optimal wavelength(s) for photosynthesis?

56. (2 points) Why are the action spectrum and absorption spectrum not the same?

57. (2 points) Relatively speaking, how does the pH of the thylakoid space compare to that of the stroma?

58. (1 point) What is the term for the growth in thickness of the plant body?

59. (2 points) If we cover the tip of a seedling with a cap made of an opaque material and place it in a room with only a light source to the left, which direction would the seedling grow in? If the cap were made of a transparent material, how would the direction change?

60. (4 points) What are the three components of the triple response? What hormone is it triggered by?

61. (2 points) What is the difference between a totipotent cell and a pluripotent cell?



Use this image for the next six questions.

62. (1 point) Give the common name of the above tree species.

63. (1 point) This tree has both bisexual (perfect) flowers and staminate flowers on the same inflorescences. Where on the inflorescence are the perfect flowers?

64. (1 point) Where on the inflorescence will the fruits form?

65. (2 points) This tree is not wind-pollinated. What about the pistils on the bisexual/perfect flowers might make it hard for this pollen carried by the wind to get into the style?

66. (1 point) This tree species is primarily pollinated by butterflies and moths. What about them might make them be able to pollinate this tree's flowers?

67. (1 point) How many seeds does this plant usually have per seedpod?



Use these images for the next six (or more?) questions.

68. (1 point) Give the common name of the tree species in image A.

69. (1 point) Give the common name of the tree species in image B.

70. (1 point) Give the common name of the tree species in image C

71. (1 point) Order them from least to greatest in how quickly their leaf litter decomposes.

72. (1 point) What is something in the leaves that could result in this difference?

73. (2 points) How might this difference in how easily the leaves decompose change how fire spreads?



74. (2 points) The photo above shows pre-settlement fire regimes in parts of the United States. Blue shows extremely-infrequent fires. Why might the green-circled region have extremely-infrequent fires?

75. (2 points) There was a period of time with little to no fires in the recent past. Name three anthropogenic things which could have caused that.

76. (1 point) In some of the forests in the Eastern U.S. o' A (and prob other places), when you have more tree cover (more trees in a general area), fires are more likely to have a higher intensity (top-kill more trees). Why might that be?

77. (2 points) In many forests of the Eastern U.S. of A, fires are less frequent when there's more tree cover. Why might that be?

78. (2 points) All this fire suppression has resulted in less frequent fires happening which in turn has resulted in even less frequent fires. Would you expect this to result in more shade-tolerant or shade-intolerant trees to start existing? How come?

79. (1 point) Your friend Bald Shrudas says that this is “a viscous(vicious) cycle in a lot of places.” What does he mean by that?

80. (2 points) A lot of these shade-tolerant trees (like the American Beech) are known for having really dense canopies. How might that give an advantage to it? (a reason completely unrelated to fire)



81. (1 point) Give the common name of the tree species above.



82. (1 point) Give the common name of the species in the above picture.



83. (1 point) Give the scientific name of the tree species in the above image.



84. (1 point) Give the scientific name of the tree in the above image.



85. (1 point) Give the scientific name of the tree species in the above image.



86. (1 point) Give the scientific name of the tree species in the above image.



87. (1 point) Give the common name of the species in the above picture.

88. (1 point) Fermi Question: How many leaves are there in all the trees in the world?



89. (1 point) Give the scientific name of the tree species in the image above.

90. (1 point) What is your favorite tree (doesn't have to be on the National Tree List)?

91. (7 points) Let's end with an open-ended long-response thing. This question will just be graded on a length requirement (≥ 7 sentences) and whether it express an opinion. Asking it here because it's probably worth thinking about. **Question: What's your opinion on logging/forest-management/fire management/other? Do you believe it should change? If so, how?** (There's a textbox below with some things to think about if you're stuck)

Some things to think about if you're stuck:

- What do you feel makes a "healthy forest"?
- Is there a condition forests should "aspire towards"? Why or why not? If so, what?
- What commercial value do things in a forest bring? How does it vary with different forests?
- What other "value" do things in a forest bring? (old trees? coarse wooden debris? Other things?) How does that vary with different forests?
- Are there particular forests that should just be set aside? Why or why not? - What are the benefits of forests?
- etc.