Team Number: _____

Forestry Station Test - 2011

INSTRUCTIONS: Please write team number on top of each page of the test. You may un-staple the test and work on questions in any order, however, pages should be returned to the correct order and be restapled, when test is turned in. You may choose to split your team up and work on multiple questions at once, or work on all questions together. Stay in the assigned area. Return all tools to the table. Have FUN.

Please WRITE LEGIBLY, show all work, as you may receive partial credit where possible.

Part I -- WRITTEN EXAM - 70 Points

1. Estuaries are among the most productive ecosystems on earth and have been considered by some to be second only to the rainforests in productivity. **(1 point)**

Circle the correct answer - True or False

2. State, federal and territorial laws and regulations do not provide for the protection of marine areas. **(1 point)**

Circle the correct answer - True or False

3. Salt water estuaries are semi-enclosed areas where sea water and freshwater mix. **(1 point)**

Circle the correct answer - True or False

4. Four common characteristics frequently used to define a freshwater estuary: 1) a drowned river mouth; 2) a zone where lake and river waters mix; 3) influence from seiche or wind tides; and 4) many freshwater estuaries have a bar or spit that partially encloses the river mouth. **(1 point)**

Circle the correct answer - True or False

5. List three examples of federal or state environmental legislation relating to the practice of forestry. **(6 points)**

A _____

B. _____

C. _____

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6. You are measuring a Ponderosa Pine tree with a clinometer. However, due to the tall brush you cannot get a good view to the top of the tree. To get a better view, you measure out 100 feet (horizontal distance) uphill from the tree. The reading you get at the base of the tree is (-9%). The reading to the top of the tree is (+90%). **(4 points)**

The height of the tree is _____feet.

7. Match each of the silvicultural systems (also referred to as regeneration methods) A through E below **(10 points)**.

A) Clearcut

B) Seedtree

C) Shelterwood

D) Single-Tree Selection

E) Group Selection

__ A stand in which essentially all the trees are removed in one operation.

__ Individual trees of all size classes are removed more or less uniformly throughout the stand, to promote growth of remaining trees and to provide space for regeneration.

__ The cutting of most trees, leaving those needed to produce sufficient shade to produce a new age class in a moderate microenvironment.

__ Trees are removed and new age classes are established in small groups.

__ The cutting of all trees except for a small number of widely dispersed trees retained for seed production and to produce a new age class in fully exposed microenvironment.

8. Using the clinometer, what is the total height (to the nearest foot) of the tree marked with blue flagging? **(2 points)**

The height of the tree is _____feet.

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9. If you were asked to measure a trees diameter at DBH, how high above the ground would you measure the tree? **(2 point)**

_____ inches up on the _____ side of the tree.

10. Using the "*Section"* diagram below, fig 1, provide a detailed legal description for X: **(4 points)**

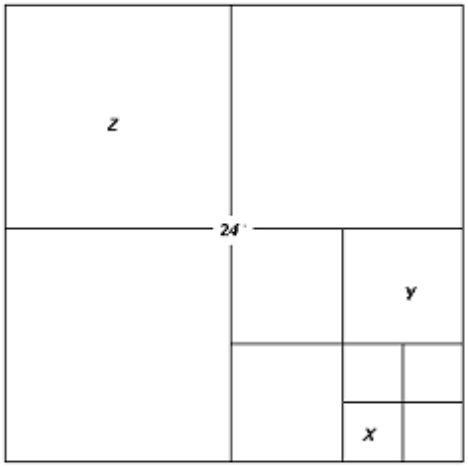

Fig. 1

X: _____1/4 of the _____1/4 of the _____1/4 of section _____

11. Again, referring to the *Section* diagram, determine the acreage of the box associated with letter Y. **(1 points)**

Y) _____

12. Define the following: **(4 points)**

A) A board foot measures: ___ inch(es) by ___ inches by ___ inches

B) A cord measures: ___ feet by ___ feet by ___ feet

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C) MMbf means: _____

D) Ccf means: _____

13. Name the forestry equipment placed on the table and labeled A through E: **(5 points)**

A) _____

B) _____

C) _____

D) _____

E) _____

14. Using answers from question 13, what piece of equipment would you use if you wanted to get a rough estimate of 16-foot logs from a tree? **(1 point)**

_____

15. Using answers from question 13, what piece of equipment would you use if you wanted to know the percent slope of a timber unit? **(1 point)**

_____

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16. Using the compass provided shoot a bearing to the tree marked in orange & white flagging, what is it's bearing, what is it's back bearing? **(1 points)**

_____

17. Thinning forest stands (density management) allows resources, such as light, moisture, and nutrients, to be concentrated on fewer trees, thus allowing healthier and faster growing trees. These trees may also be better situated to withstand root-rot and fire, with better spacing and thicker bark development, in some cases, for fire protection. You are marking an "understory" or "low" thinning or "thinning from below". Crown classes have been used to describe tree by the amount of light they receive and their position in the canopy. Which trees, by crown position, do you concentrate on marking for logging an understory thinning? Circle your answer. **(2 points)**

A. Dominant and Co-dominant trees

B. Co-dominant and intermediate trees

C. Intermediate and suppressed trees

18. Using the Net Volume Table (table 1) (Scribner Volume Table), determine the volume of a pine tree that is 112 feet tall and has a DBH of 34 inches. **(1 point)**

Volume =

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19. Name 3 trees common to the Coastal Range and/or the Sonoma County Mountains, common names are fine. **(3 points)**

A) _____

B) _____

C) _____

20. *Write in the blank, the forestry term described below:* **(8 points)**

a. A species-specific measure of actual or potential forest productivity, expressed in terms of the average height of trees included in a specified stand component at a specified index or base age.

_____

b. The conversion of water within plants into water vapor that is released to the atmosphere.

_____

c. A stand of a single species, generally even-aged

_____

d. A planned sequence of treatments designed to maintain and regenerate a stand with three or more age classes

_____

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e. A layer of cells just inside the bark of plants that conducts food from the leaves to the stem and roots.

_____

f. The principal water-conducting tissue of higher plants, composed of tracheids, vessels, fibers and parenchyma.

_____

g. The cross-sectional area of a single stem, including the bark, measured at breast height.

_____

h. A standing, generally unmerchantable dead tree from which the leaves and most of the branches have fallen.

_____

21. List the three sides of the “Fire Triangle” **(3 points)**

a) _____

b) _____

c) _____

22. Name two ways a redwood regenerates? **(1 point)**

a) _____

b) _____

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23. The current increase in instances of wildfire across the U.S. can be explained by: Circle the correct answer. (**1 point)**

a) Past fire suppression policies, including on the "total suppression", which allowed for the accumulation of fuel in the form of fallen leaves, branches, and excessive plant overgrowth in forest and wildland areas.

b) Increasingly dry, hot weather in certain geographic areas.

c) Increased residential development in the wild land / urban interface.

d) All of the above.

24. The number one cause of tropical deforestation worldwide is: Circle the correct answer. **(1 point)**

a. commercial logging.

b. wildfire.

c. clearing of lands for agricultural use.

d. gathering of firewood.

e. building of roads and cities.

25. Which of the following statements most accurately describes United States forests: Circle the correct answer. **(1 point)**

a. forest harvest exceeds net forest growth by 8 percent.

b. forest harvest exceeds net forest growth by 3 percent.

c. forest harvest roughly equals net forest growth.

d. net forest growth exceeds harvest by 19 percent.

e. net forest growth exceeds harvest by 50 percent.

26. California imports nearly 80% of the wood we use in the state. Circle the correct answer. **(1 point)**

True or False

Fill in the missing word for each statement: 27-28

27. Carbon sequestration is the uptake and storage of carbon. Trees and plants, for example, absorb_____, release the oxygen and store the carbon. **(1 point)**

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28. Carbon sinks are carbon reservoirs and conditions that take-in and store more carbon (i.e., carbon sequestration) than they release. Carbon sinks can serve to partially offset greenhouse gas emissions. _____ and oceans are large carbon sinks. **(1 point)**

29. Some trees common to this region are listed below. Fill in the appropriate blanks with either: the Common Name, Genus, or Species that corresponds to each. **(4 points)**

Common Name	Genus	Species
Douglas Fir	Psudotsuga	_____
Incense Cedar	_____	Decurrens
_____	Sequoia	Sempervirens
California Coast Live Oak	_____	Agrifolia

End of Part I ;-)

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PART II FIELD SITUATION - (30 POINTS POSSIBLE) – Must show your work to get the points!

Your team has recently started a forestry consulting firm, Coastal Forestry Consultants. Your firm has been asked to prepare a preliminary assessment of a client's property. Your new client, Douglas Wood owns 150 acres of forestland in the California Coastal Mountains. Mr. Wood doesn't have much money, so you can't spend much time working on his property. You'll have to get what information you can, and then extrapolate that information to fit the whole property.

Mr. Wood shows you where he wants you to put the one and only variable cruise plot. (Defined as Plot 1, 2 or 3.) He gives you a 20-factor prism and says "good luck".

1. Using the prism, how many "in" trees do you have from your plot center? **(4 points)**

_____ "in" trees.

2. What is the average square feet of basal area per acre for redwood only, based on your cruise plot and calculations? **(4 points)**

_____ square feet of basal area per acre.

3. Using the key provided, determine the species of the tree flagged with red and white striped flagging. **(2 points)**

_____

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4. Which is an alternate method foresters sometimes use to determine the age of a young conifer tree without the use of any instruments? Circle your answer. **(1 point)**

A. Estimation by the use of the height and species of the tree.

B. Counting the growth whorls from the bottom to the top of the tree.

C. Estimation of the diameter and the height of the tree.

Select either Tree A or Tree B and give the measurements below: use the same tree for all three questions 5-6-7.

5. Using the clinometer, what is the total height (to the nearest foot) of the tree you measured? **(5 points)**

Tree A Height _____ *or* Tree B Height _____

+/- 1 or 2 feet = 5 points, +/- 3 or 4 feet = 4 points, +/- 5 or 6 feet = 3 points, +/- 7 or 8 feet = 2 points, +/- 9 or 10 feet = 1 point

6. Using the diameter tape, what is the DBH to the nearest inch, of either tree A or tree B? **(2 points)**

Tree A _____ or Tree B _____

7. Using the Merritt Hypsometer, how many 16-foot logs are in Tree A or B? **(2 points)**

Number of 16-foot logs in Tree A _____ or Tree B _____

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Mr. Wood points out a large tree to you, Tree C, which is adjacent to the property. He believes there is an endangered bird living in that tree. He would like to know a couple of things about that tree:

8. From your plot center: a) how far away is the tree? And b) using the compass provided, what is the bearing (for example North 36º East) from the plot center to the tree? **(4 points)**

a) _____

b) _____

Partial credit for numbers 1 to 4 feet or degrees off.

Just as your firm finishes collecting the preliminary data, Mr. Wood shows up. He provides you with some additional information to help complete your analysis. You are given a local volume table (Fig. 2). Mr. Wood tells you that logging costs average $100/thousand board feet and that Redwood is currently selling for $500 per thousand board feet. In Sonoma County, the law states that you can only harvest 50% of the standing volume. Finally, he says that he doesn't want you using your data, but that you should use his data. He says that he has one 20 inch diameter redwood, one 24 inch diameter redwood and one 38 inch diameter redwood per acre. Mr. Wood wants to harvest as much as he can. Given this information, Mr. Wood would like to know the following:

9. Using Mr. Woods' variable cruise plot results, and the local volume table, estimate how much volume (in Scribner board feet) Mr. Wood has over his entire 150-acre property? (hint: You do not need to measure anything … use the information given. You must show your math!) **(2 points)**

a) _____Scribner board feet (Math work area)

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Fig 2. ***Sonoma Local Volume Table***

(Scribner Board Foot Volumes)

DBH	Douglas-Fir	Redwood	(Math area)
18	220	199	
20	310	285	
22	420	394	
24	550	515	
26	700	650	
28	800	800	
30	1080	965	
32	1300	1150	
34	1570	1348	
36	1830	1560	
38	2100	1805	
40	2400	2060	
42	2750	2345	

10. What is the volume Mr. Wood can harvest? **(2 points)**

_____ board feet

11. How much will it cost to log his property (considering what can be cut)? **(2 points)**

_____

12. How much money can Mr. Wood expect to make if he logs according to Sonoma County laws? **(2 points)**

_____

End of Part II :-)

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