Professional Foresters Registration Examination

APRIL 15, 2011

PART I

Instructions: APPLICANTS, PLEASE READ THESE INSTRUCTIONS CAREFULLY. You MAY complete PART I by doing ONE of the following two options:

A) Complete the Short Answer Section (Question 1) and Any Two (2) of the Essay Questions (Questions II through V)

OR

B) Complete Any Three of the Essay Questions (Questions II through V) and OMIT answering the Short Answer Question (Question I).

Question I - Short Answer
Question II - Forest Mensuration
Question III - Forest Ecology
Question IV - Silviculture
Question V - Forest Protection

Professional Foresters Registration
1416 9th Street, Room 1506-16
Sacramento, CA 95814

Applicant #:_____
Question # __I_____

Answer on these pages, tear from the booklet and submit with the answer packet if you chose Option A for Part I of this examination.

ACRONYMS AND ABBREVIATIONS USED IN THIS EXAMINATION

The following Acronyms and /or Abbreviations **may be used** in this examination. Technical abbreviations that should be known by a forester are NOT included here (e.g. DBH, MAI, MBF). You may remove this page for reference throughout this examination. **It need not be returned.**

Acronym or Abbreviation	Full Text
BOF	California State Board of Forestry and Fire Protection
CCR	California Code of Regulations
CDFFP	California Dept. of Forestry and Fire Protection
CDF&G	California Department of Fish and Game
FPR	California Forest Practice Rules
PRC	California Public Resources Code
RPF	California Registered Professional Forester
THP	California Timber Harvest Plan
TPZ	California Timber Production Zone

Applicant #_____
Question # I

Answer on these pages, tear from the booklet and submit with the answer packet if you chose Option A for Part I of this examination.

QUESTION I - SHORT ANSWERS

3% 1. The extent to which the lower portion of a tree's stem diverges from straight, usually measured in degrees, is termed _____ .

3% 2. When an alien or exotic species can establish, grow, reproduce, and maintain itself in an area where it did not originally grow, it is said to be:
_____.

3% 3. A stream which derives most or its entire nutrient energy source from such things as terrestrial insect drop and litter fall from terrestrial vegetation is described as an _____ type of stream?

4% 4. Which of the following tree species are susceptible to white pine blister rust? *Pinus monticola, Pinus lambertiana, Pinus ponderosae, Pinus sabiniana, Pinus attenuata, Pinus contorta*?
_____ .

2% 5. According to Section 763 of the Professional Foresters Law, what is the minimum number of individuals who are to be appointed by the Board to serve on the Professional Foresters Examining Committee?
_____.

4% 6. According to the definition in 14CCR 895.1, define the two conditions required in the abandonment of a forest road.
_____
_____
_____

4% 7. For THP planning purposes, how would you define an "Active Nest" of an Osprey when you have not seen an Osprey occupy the nest in the 3 months you have been doing THP fieldwork?
_____
_____
_____
_____

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Answer on these pages, tear from the booklet and submit with the answer packet if you chose Option A for Part I of this examination.

QUESTION I - SHORT ANSWERS

3% 8. The marking of the most commercially valuable trees for cutting under an individual tree marking regime is normally termed:
_____.

4% 9. What other law was brought to bear on the Forest Practice Act by the court ruling in Natural Resources Defense Council, Inc. v. Arcata National Corp. (or "Broaddus Decision") [Answer must be written out in its entirety, no abbreviations]?
_____
_____
_____
_____

4% 10. List two types of fixed costs and two types of variable costs generally associated with harvesting equipment.
_____
_____
_____

4% 11. A rectangular piece of land measures 40.2 chains by 78.5 chains. How many acres are in this piece of property? _____

4% 12. In performing a Stocking Survey for a plantation area, you lay out a uniform grid as prescribed and sample 80 plots. What would be the minimum number of stocked plots needed to find the area in a stocked status, according to the CA Forest Practice Rules?
_____
_____

3% 13. . What California law requires forest practices regulations to address archaeological resources? _____

3% 14. A scale of 1: 6,000 translates to how many feet on the ground per inch on a map? _____

4% 15. List four (4) environmental or topographic settings that are common locations of prehistoric archaeological resources found on California timberlands.
_____
_____
_____

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Answer on these pages, tear from the booklet and submit with the answer packet if you chose Option A for Part I of this examination.

QUESTION I - SHORT ANSWERS

4% 16. *Armillaria mellea* (oak root rot) is endemic in California. What are two ways by which you can decrease the prevalence of this problem in a forest setting?

_____
_____
_____
_____
_____

3% 17. The distance from a landing to the farthest point in the cutting unit is called the _____.

3% 18. The process by which a landscape is broken into small islands of forest within a mosaic of other forms of land use or ownership is known as

_____

3% 19. As applied to the growth of an even-aged stand of trees, what is the term for the point where the volumetric MAI is greater than zero and equal to the volumetric PAI?

_____
_____

3% 20**.** There are multiple permit options available for fuel hazard reduction on private and state-owned lands. Under the "La Malfa" **Forest Fire Prevention Exemption** (14 CCR 1038(i)), what is the acreage limit that may be treated?

_____.

4% 21. List four (4) characteristics of fuels that affect the way fires burn, and are important in prescribed fire management.

_____
_____
_____
_____

3% 22. How many trees per acre would you plant to achieve 16' spacing between trees?

_____

3% 23. Why does the concept of MAI not apply well to uneven-age stands?

_____
_____

CONTINUED NEXT PAGE

Applicant #_____
Question # I__

Answer on these pages, tear from the booklet and submit with the answer packet if you chose Option A for Part I of this examination.

QUESTION I - SHORT ANSWERS

4% 24. List four purposes a THP document serves during its life:

_____
_____
_____
_____

3% 25. In logging terminology, define the term deadman.

_____
_____
_____

3% 26. What is the common name of a California native fern that may indicate wet conditions in a forested environment? _____

3% 27. A deduction from taxable income, allowed under specific conditions, by U.S. tax laws to the owners of timber for reduction of an original growing stock through cutting is called _____ .

3% 28. What is the radius of a 1/5-acre inventory plot? Round to the nearest tenth.

_____

3% 29**.** Besides carbon dioxide (CO2), name three (3) other naturally occurring "greenhouse gases" present in the Earth's atmosphere.

_____
_____
_____

3% 30. Briefly define a "blind lead or area" in logging terminology and state the obvious negative environmental result which can occur in that situation.

_____
_____
_____
_____

END OF QUESTION

QUESTION II - FOREST MENSURATION

OBJECTIVE

This question is to determine your ability to describe fundamental mensuration principles and explain their relative importance.

SITUATION

Consider yourself to be an inventory forester for the Small Time Timber Co. The firm's president recently hired a young accountant. The accountant has asked you to answer certain questions about a recent point sampling cruise that you did in a mature stand of Douglas- fir. After talking with this young man for a few minutes, you realize that his questions are somewhat naive and that he knows very little about forestry, timber cruising, or statistics. Therefore, you decide that your answers must be very thorough and specific. Please answer each of the following questions for the accountant.

QUESTION

10% **1.** "You determined the acreage of the cruised stand of Douglas-fir with the use of a GPS unit and computer software. **Briefly** describe what GPS is and how it works, including what type of data is obtained and stored to determine the stand's acreage and how you used the GPS unit in the field. Include in your answer a brief explanation of how the data obtained by the GPS can be used to determine the acreage of a traversed area."

10% 2. "You say that you sampled 30 points and used a BAF (basal area factor) of 50. What do you mean by points? What is a BAF? What percent cruise intensity is this?"

15% 3. "You say that the average stand basal area was 400 square feet per acre. What does this mean? How did you calculate it? On the average, how many trees per point would it take to get 400 square feet per acre? Is 400 square feet per acre good or bad stocking?" Explain your answer.

15% 4. "You say that the average tree in your stand has a net V-BAR (Volume- basal area ratio) of 33.0 (based on cubic feet to a 4-inch top). What is the net volume per acre and how do you calculate it? Does the V-BAR change with the age of the stand? If so, why?"

CONTINUED NEXT PAGE

10% 5. "If you sampled a tree that had a DBH of 24 inches, how much basal area does this represent? How many trees per acre would a sampled 24 inch DBH tree represent?"

20% 6. "You say that each tree measured during the cruise represents the same amount of basal area per acre no matter how big the tree is. That doesn't make sense to me. Can you explain why this is so?"

20% 7. "You say that your net volume standard error was 12 percent. What kind of error is this? Why did it occur? What does it mean about the reliability of your work? How can it be avoided in the future?"

END OF QUESTION

QUESTION III-FOREST ECOLOGY

OBJECTIVE

Concern has been expressed in areas such as the Tahoe Basin that commercial forestry and other forestland management operations could contribute to cultural eutrophication of Lake Tahoe. Similar concerns exist in California and other states for both fresh and ocean waters.

QUESTION

50% 1. Define, explain and compare the journey of oligotrophic waters towards eutrophication or cultural eutrophication in terms of processes and ecological consequences.

20% 2. Identify and briefly discuss three important types of forest land-use practices that might contribute to cultural eutrophication;

30% 3. Summarize the practices that might be followed to reduce the risks you list in Question 2.

END OF QUESTION

QUESTION IV-SILVICULTURE

OBJECTIVE

To determine your ability to synthesize site-specific information and develop a valid silvicultural prescription.

SITUATION

Northwestern California (Coast District)

- 150 acre unit; zoned TPZ
- Timber production is the best use of this property;
- Physical and biological circumstances favorable for tree growth
- Ground located on a ridge system with a generally westerly aspect;
- 1,500 - 2,000 feet elevation

Site Information

- Site class is low II - high III
- Entire property burned in late 2003 and all salvage logging and site preparation work will be completed by the Fall - 2005
- The fire consumed the previous vegetative cover on this acreage.
- Slope on this property averages 30-35%, with steep short pitches to more than 50% especially near the two (2) Class II watercourses and the several Class III watercourses that flow through the property.

Information on Vegetation

- Stand age when burned was about 60 years old.
- Previous stand was an unmanaged, moderately stocked Douglas-fir type, but had supported a high stem count of tanoak that made up approximately 30% of stand basal area.
- Pacific madrone occurred as scattered trees in the previous stand.
- Other noticeable broadleaf species in nearby plantations include; hairy manzanita, deer brush and salal.
- Heavy concentrations of various grass species evident, especially on southerly aspects.
- Clumps of hardwood coppice are beginning to show abundantly throughout the burned area.

CONTINUED ON NEXT PAGE

Owner Goals

- Return this substantially damaged timberland to tree production as soon as possible**.**
- Intend to maximize the sustained productivity of high quality timber products in keeping with the Forest Practices Act.

QUESTIONS

You have been retained as a forestry consultant to devise a cost-efficent silvicultural prescription to reforest this site and to grow a managed timber crop to an even-aged rotation within 75 years.

20%	1. Discuss your regeneration strategy and the physical and biological resistance that must be overcome through the plantation establishment phase.
20%	2. Prescribe cost effective treatments for plantation management through the early phase of site dominance.
15%	3. Propose/discuss density control treatment(s) and level of crop tree retention across treatment areas.
10%	4. Evaluate and discuss another cultural treatment you might prescribe to enhance wood increment on this developing forest stand.
15%	5. Discuss any intermediate commercial treatments and justify their application.
20%	6. Generally describe this 150-acre stand type by species composition and structure - both vertically and horizontally by 60 years of age in terms of basal area or other appropriate description.

END OF QUESTION

QUESTION V- FOREST PROTECTION

OBJECTIVE

To determine your knowledge of forest root diseases and their management in western forest types.

QUESTIONS

15% 1. Root diseases can be caused by both biotic and abiotic factors. They are often thought of as detrimental features in the management of forest stands. However that assumption may not be always correct. Discuss three possibly **beneficial** aspects root diseases may have in the ecology of a forest.

15% 2. You can identify fungal-caused root diseases by observing the infected tree's symptoms and signs.

A. Give the common or scientific names of 3 fungal root diseases found in western US conifers.

B. What are the differences between symptoms and signs of root disease?

30% 3. For the 3 diseases you listed in question 2, **select 2** and briefly discuss the following:

A, What specie(s) of trees are commonly attacked by the disease?

B. Give two examples of symptoms **and** two examples of signs of any common root disease found on western conifer species.

C. What is the best indicator(s) of the presence of each disease?

40% 4. Discuss **four silvicultural methods or techniques** that have been used to control or manage root disease spread in western forests. Note that you are discussing methods for any of the root diseases caused by fungi or abiotic factors, not just one disease. A more complete answer will indicate what root disease you think is best managed by the method you are discussing and how the silvicultural method will help lessen or combat root disease.

END OF QUESTION

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PART II

Applicant Must Answer Three Of The Remaining Five Essay Questions In Part II

Question VI-Forest Engineering
Question VII-Forest Economics
Question VIII-Forest Administration
Question IX-Forest Policy
Question X-Forest Management

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QUESTION VI-FOREST ENGINEERING

OBJECTIVE

To demonstrate your understanding of the relationship between management goals, forest road standards and location, and environmental effects.

SITUATION

A primary requisite to forest operations is a transportation system. In most cases, access to forestland is accomplished by the location and construction of truck roads. Management goals will dictate the standards of the roads to be constructed and thus affect the methods of location and construction employed.

QUESTION

20% 1. When describing road standards, explain what is meant by PHYSICAL standards and SERVICE standards. Include 3 examples for each type of standard.

30% 2. Discuss how differing management goals may affect the selection of road standards if the forest landowner is

a) a public agency,
b) a small private land owner,
c) a large industrial owner.

Give examples in your answer.

20% 3. **Define** the following elements of forest road route selection. Briefly **discuss** how these elements relate to one another in practice.

-reconnaissance
-control points
-gradelines

30% 4.Poor choices of road standards **and** route selection can result in significant negative environmental impacts. Identify three (3) road standards and two (2) route selection considerations that may result in significant negative environmental impacts. Identify two possible impacts for each route standard and route selection you have chosen to discuss and for each impact, briefly discusses a mitigation, which might address each possible impact you list.

END OF QUESTION

QUESTION VII-FOREST ECONOMICS

OBJECTIVE

To determine your ability, as a Forester, to sell timber from a THP for your client and derive the most economic benefit for your client.

SITUATION

Assume that you are a forest consultant to a family with relatively large forest and ranch land holdings. Although a large portion of their property is timbered, they consider themselves ranchers and defer to your judgment on matters pertaining to the management of the forested lands. However, in order to live in their accustomed style, they desire to **NET** at least $1,250,000 from timber each year. Consequently, you normally offer whatever timber volumes are necessary to yield at least this amount, within the sustained yield capability of their ownership. The results to this year's sale offerings are given below:

Species	Volume, MBF*	Mill #1 Bid	Mill#2 Bid	Mill #3 Bid
		$/MBF		
Ponderosa Pine	5000	415	345	405
Sugar Pine	2700	450	390	415
White Fir	1200	190	170	170
Douglas-fir	2200	210	165	185
Incense Cedar	600	100	550	175

* All volumes in thousand board feet, net scale

These prices represent what the mills will pay for logs delivered to their yard. Payment is to be based upon **net** scale, not lump sum. You have talked to your contract logger and he has provided you with the following information: He will charge $75/MBF to get the timber from stump-to-truck, and the hauler he plans to subcontract with charges $800 per day for the truck-and driver. The truck can carry an average 5 MBF per load and will be able to make one round trip per day to Mill #1, four round trips per day to Mill #2, and two round trips per day to Mill #3.

CONTINUED NEXT PAGE

In addition, the private road to the logging area crosses property owned by Mill #1. You have negotiated a Right-of-Way fee of $10/MBF, which will be waived if Mill #1 is the successful bidder.

You have made it clear to all the bidders that you are under no obligation to sell to the highest bidder of any species or in the aggregate amount. You will make your decision to sell based on the greatest **net** return to the client. In the past, however, you have sold the year's timber offerings to one mill rather than to several mills.

QUESTION (Show all calculations)

15 % 1. What is the haul cost per MBF to each mill?

2. Assume that all of the timber will go to a single purchaser rather than send one species to one mill and another species elsewhere.

15 % a. Discuss 3 possible reasons why it may be desirable to sell the timber to just one purchaser.

25 % b. In order to maximize returns to the family, show by table and computations how you would determine to which of the three mills you would award the bid. (Use the given data as your basis for selling all timber to a single purchaser.)

15 % 3. Discuss some reasons why Mill #2 would bid $550 per MBF for the incense cedar.

15% 4. Discuss how and if your decision may change if Mill #2 specified that they would only accept logs cut to Specialty lengths, i.e. 17 and 34 feet, while Mill #3 would take anything from 8 feet on up (scaled in two foot intervals).

15% 5. Discuss five additional costs, which the family has to pay before they could realize a true "net return" of $1,250,000 from timber.

END OF QUESTION

QUESTION VIII- FOREST ADMINISTRATION

OBJECTIVE:

As part of s THP, a landowner must be aware of relevant California Department of Fish and Game (CDFG), regulations. To meet this responsibility, the Fish and Game Code (Section 1602) requires an entity to notify CDFG of any proposed activity that may substantially modify a river, stream, or lake. If CDFG determines that any forest management activity may substantially adversely affect fish and wildlife resources, a Lake or Streambed Alteration Agreement (SAA) must be prepared. The RPF may act as the designated agent for the landowner. This question is intended to determine your knowledge of this requirement.

QUESTIONS:

30% 1. Briefly describe some **specific** conditions must you notify CDFG of any proposed activity that may substantially modify a river, stream, or lake.

15% 2. Briefly describe how you or the landowner would notify CDFG and what would be the cost to meet this requirement for an individual project on a THP area.(other than the time and efforts of the RPF in preparing the THP or other documents).

40% 3. Describe in some detail what happens after the RPF or landowner submits the SAA.

15% 4. Suppose a storm or some other disaster requires the performance of some in stream work (e.g.-replace a large culvert) that, in the past, required a SAA. What would you do to meet the needs created by the disaster?

END OF QUESTION

QUESTION IX- FOREST POLICY

OBJECTIVE

To determine your knowledge of the laws and agencies a RPF must work with to facilitate timber operations in California.

SITUATION

Assume that you have the responsibility for planning and supervising a harvesting operation on an area of privately owned forestland in California.

QUESTION

10% 1. . Identify **five** separate **State** regulatory agencies with which you may have to work in preparing and administering your THP.

45% 2. List and briefly discuss the principal laws through which each of the State agencies (that you have listed in Question 1 above) have authority to impact forest practices.

45% 3. For the five agencies that you listed in Question 1, explain how each agency interacts and meets its regulatory obligation.

END OF QUESTION

QUESTION X- FOREST MANAGEMENT

OBJECTIVE

To demonstrate your understanding of the dynamics of forest tree and stand growth and management implications.

QUESTION

50% 1. Assume that you are reviewing a forested area that has three different Ponderosa Pine stands that share the same site, species composition, and harvest history, but have different densities. The densities are low-density sawtimber, medium density sawtimber, and high-density sawtimber. For each stand, provide initial numeric values of stocking and growth representing a commercial forest type with which you are familiar.

- For each of the stands, discuss the relationship between stocking levels and growth. Please use the Langsaeter Curve as the basis for your answer.
- How does the density of each of the tree stands change over time? Include discussion of individual trees and the stand as a whole.

25% 2. Thinning is a long accepted method for managing forest stands. Using the stand that you assumed for discussion in Question 1, describe how, in theory, you would improve the overall health and vigor of the forest stand while improving opportunities for increased growth and yield of forest products. Please use Langsaeter's curve and principles to facilitate your discussion.

25% 3. For the management practice of thinning, discuss the physiological and economic tradeoffs of using a short re-entry versus a long re-entry management regime and the effects on the sustainability of thinning practices in the future.

END OF QUESTION

END OF EXAMINATION