National Exams December 2010

04-For-A6, Silviculture

3 hours duration

NOTES:

1. If doubt exists as to the interpretation of any question, the candidate is urged to submit with the answer paper, a clear statement of any assumptions made.

2. This is a CLOSED BOOK EXAM.
   A Casio or Sharp approved calculator is permitted.

3. Questions 1 and 2 must be completed, of the 5 remaining questions, the examinee has the option of choosing the remaining 3 questions. FIVE (5) questions constitute a complete exam paper.
   The first five questions as they appear in the answer book will be marked.

4. Each question is of equal value of 20 marks.

5. Most questions require an answer in essay format. Clarity and organization of the answer are important.

December 2010, Examination Questions, Silviculture

1. Explain why foresters, forest engineers and forest technicians focus on silviculture for wood production and forest management. Provide a definition of silviculture and aexplain the relationship between wood quality, individual tree growth and stand growth.

2. An understanding of Silvics is essential when practicing silviculture. With respect to regeneration, describe the modes of regeneration for hardwood and softwood species. Explain how the regeneration strategies for each species can lead to a single cohort and stratified mixture.

3. List and describe the natural stages of stand development following a disturbance as per Ralph Nyland, Silviculture Concepts and Application. Ensure your answer is comprehensive, complete and detailed. Explain what is happening at each stage of development and why it is occurring.

4. In terms of stand development, explain why foresters use interventions such as pre-commercial thinning, artificial regeneration, natural regeneration, commercial thinning and harvest practices to influence stand growth. Describe and explain what the goals for each intervention are. Explain how harvesting (Clearcut, select cut) is considered to be silviculture.

5. Given four common tree species to Canada, Red Maple (*Acer rubrum*), White Birch (*Betula papyrifera*), Balsam Fir (*Abies balsamea*) and White Pine (*Pinus strobes*). Define their reproductive strategies, shade tolerance, longevity, water tolerance and rooting behavior for each. If each of these species originated from the same disturbance, on the same site, demonstrate their location in the crown class over a time horizon and explain why they occur where you describe. Assume these 4 species originated on the site prior to the disturbance, meaning they were naturally abundant before the disturbance and the site was suitable for their growth.

6. What is the difference between a stand and a site when assessing a parcel of land? List and describe the characteristics that occur on each and explain the impact they have on the tree growth if applicable. Therefore, define stand and site, describe the qualities one would use to assess each and explain the resulting impact on tree growth.

7. Commercial Thinning is a silviculture tool implemented in stands in the hopes of influencing growing stock. Describe what commercial thinning is, how it can be implemented and explain common commercial thinning types showing their resulting impact on stand average dbh after the intervention, density and potential stand health. Which commercial thinning type(s) are likely to be more profitable and explain why?

Marking Scheme

All questions have equal weight. All question components are weighted equally.