

FSTY 405 — Silviculture II

Midterm, 14 October 2004

Name:

Student number:

- Ensure that your name and student number are correctly entered above.
- Answer in the spaces provided, writing down clearly any intermediate steps. Use the reverse as scratch pad. Writing just the final numerical answer is *not* acceptable.
- Write clearly, and use ink, not pencil.
- Answer clearly and to the point. Writing nonsense causes marks to be taken off.
- Pages: 4. Questions: 4, worth 1 mark each.
- Time: 45 minutes.
- Info (you may or may not need this): $\ln xy = \ln x + \ln y$, $\ln x^y = y \ln x$, $y = \ln x \Leftrightarrow x = e^y$, $e^{x+y} = e^x e^y$

1. The growth rate in the Richards model is

$$\frac{dH}{dt} = aH - bH^c,$$

where a , b and c are parameters.

- (a) (33%) Find the asymptote (maximum limiting height) as a function of the parameters.
- (b) (67%) Draw a Vensim diagram to simulate the growth. Write the equation(s) for the rate component(s). Indicate where an equation goes with a dashed arrow.

2. What is:

(a) Guide curve

(b) Normal yield table

(c) Growth intercept index

(d) Eichhorn's law

3. We have the following relationship between top height (H , metres) and age (A , years):

$$\ln H = a - b/A ,$$

where $a = 3.65$, and b varies with site quality. The site index (base age 50) is 21. Estimate the age at which the top height reaches 15 m.

4. Mention, and briefly explain, two methods that could be used to estimate the site index for a tree-less planting site.