Puu-28.3001 Material Properties of Wood

Examination 18th December 2009

Total Marks 50

1. Explain briefly the following terms (use a diagram support your answer if necessary): ***(10 marks)***

   i. "Fibre saturation point"
   ii. "Bound water"
   iii. "Free water"
   iv. "Adsorption"
   v. "Microfibril"

2. What are the main structural polymers found in wood? Using the analogy with fibre reinforced composites, describe the function of each polymer and draw a diagram to show how these polymers are thought to be arranged in the microfibril ***(10 marks)***

3. Answer all of the following: ***(10 marks)***

   a) What is meant by equilibrium moisture content (EMC) and how does this relate to relative humidity?
   b) What is meant by "sorption hysteresis"?
   c) Name two types of defects observed in wood and briefly describe how they affect wood properties
   d) What is meant by "creep" in wood and where might you expect to see this phenomenon?

4. Answer **one** of the following: ***(10 marks)***

   i. How does the structure of the wood cell wall affect the elastic and strength properties of wood?
   ii. Where would you expect to see interfaces in wood and how do they influence wood properties?

6. Write an essay (1-2 pages) on **one** of the following topics: ***(10 marks)***

   i. Movement in wood
   ii. Wood as an engineering material
   iii. Factors affecting the strength of wood
   iv. Wood degradation