ECE352F: Computer Organization

Problems 1

Fall 1999

The midterm will cover the problems in **Chapters 3 and 4**. Some asynchronous problems are also included. In addition, you will be responsible for what you have done in the labs. This includes the C programming and VHDL.

Chapt. 3 4, 5, 7, 10, 12, 16, 21, 23, 28, 32, 33

Chapt. 4 1, 3, 5, 6, 7, 12, 13, 18, 21, 27, 30, 32

Chapt. 5 1, 4, 6, 7, 8, 9, 10, 13, 18, 20, 22, 23

Chapt. 6 1, 5, 7, 9, 13, 15, 17, 18, 23, 25, 30, 31

Look at previous midterms:

- 1998
- 1997

Here are some asynchronous questions.

1. Try the 1997 midterm question. Note that it will reduce to two states.
2. Obtain a primitive flow table for a circuit with two inputs, x1 and x2, and two outputs, z1 and z2, that satisfy the following four conditions:
   (a) When x1,x2 = 00, the output z1,z2 = 00
   (b) When x1 = 1 and x2 changes from 0 to 1, the output z1,z2 = 01
   (c) When x2 = 1 and x1 changes from 0 to 1, the output z1,z2 = 10
   (d) Otherwise, the output does not change.
3. Design an asynchronous sequential circuit with two inputs, x1 and x2, and one out put, z. Initially, both inputs and output are equal to 0. When x1 or x2 becomes 1, z becomes 1. When the second input also becomes 1, the output changes to 0. The output stays at 0 until the circuit goes back to the initial state.
   (a) Derive the flow table. It will have two states.
   (b) Complete the design.