EE 231L Lab 2

Pre-Lab 1

Consider the following two-input, four-output circuit: the inputs are S_0 and S_1, and the outputs are D_0, D_1, D_2 and D_3. Only one of the four outputs is high – the output which corresponds to the binary number $S_1 S_0$. For example, if $S_1 S_0 = 10$, then D_2 is high, and the three other outputs are low. This type of circuit is called a decoder.

Design a circuit to implement the two-input, four-output decoder. To implement your design, you may use only 74HC00, 74HC02, 74HC04, 74HC08, 74HC32 and 74HC86 chips. Determine the functions of these chips from their data sheets. You can download the data sheets by clicking on the hyperlinks in the PDF file, or you can download them from a manufacturer's web site (such as http://www.ti.com or www.national.com).

74HC00 _____

74HC02 _____

74HC04 _____

74HC08 _____

74HC32 _____

74HC86 _____

Draw three representations for this design:

1. A two-input, four-output Truth table.

2. An input and output waveform sketch.

3. A schematic using gate symbols (see example schematic on next page). Be sure the schematic is complete — include pin numbers. (Use the DIP package from the data sheets for pin numbers.)