

Homework 7 – due Mon. 2 May at the beginning of class

(1) Draw the circuit of a **decoder** with 3 input wires. (This determines the number of output wires.)

(2) Draw the circuit of a **demultiplexer** with 3 input wires and 2 control (routing) wires.

(3) Ex. 54 (p. 544): Implement the units **5**, **6**, **10**, and **11** of the **ALU**. (For information on the arithmetic shifts ASL and ASR, see pages 107-109.)

(4) Ex. 55 (p. 544). The book refers to the control box at the right in **Fig. 10.59**. The truth table of this control box is in **Fig. 10.60**. Use two methods to implement this control box.

(4.1) Use the book's method (see the middle of page 537).

(4.2) Use our *synthesis method*, based on the truth table and the OR of AND-terms.

(5) In **Fig. 11.41** (p. 574), what boolean value (0, 1, or “don't care”) do all the input wires need to receive in order to do the following:

(5.1) Read the memory content at adress 10.

(5.2) Write 01 into memory at adress 10.

(6) In **Fig. 11.45** (p. 578), what boolean value (0, 1, or “don't care”) do all the input wires need to receive in order to do the following:

(6.1) Read the memory content at adress 10.

(6.2) Write 0110 0011 into memory at adress 10.