**CSC 244 Fall 2022 Homework 4**

**Combinational Building Blocks**

**Due: Wednesday, Sept. 21 before 9 am to D2L**

1. Implement the function in Fig. 2.45 in the text book. using the combinational building blocks listed. **Clearly label your inputs and outputs according to the function.** Label your LSB/MSB clearly.
   1. An 8:1 multiplexer
   2. A 3:8 decoder with *active-low* outputs
2. Implement the following MUX networks using the MUX sizes [in brackets]. Clearly label your most and least significant input and select bits.
   1. 4:1 [using 2:1s]
   2. 16:1 [using 4:1s]
3. Implement a 4:16 decoder trees using a decoder tree of sizes using 3:8 and 1:2 with active-high enables and outputs. Clearly label your most significant inputs and outputs.
4. Write the output equation for for a 7:128 decoder. The decoder takes an active low enable () and 7-bit address () as inputs, and outputs a 128-bit one-hot output (). **Show your work.**