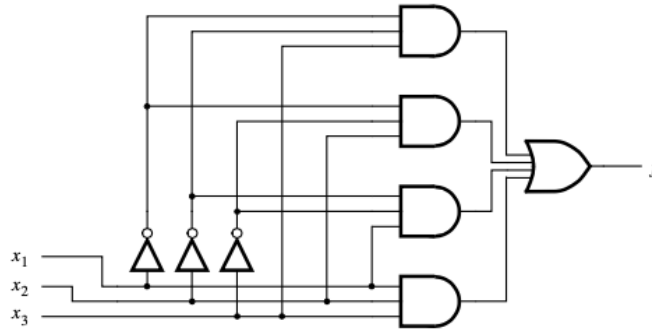# Homework 3: EE 252 Digital Electronics

1. **2.60** Write Verilog code to implement the circuit in Figure 2.32a using the gate-level primitives

(a) Sum-of-products realization

2. **2.63** Write Verilog code to implement the function $f(x_1, x_2, x_3) = \Sigma\ m(0, 1, 3, 4, 5, 6)$ using the continuous assignment.

3. **2.71** A given system has four sensors that can produce an output of 0 or 1. The system operates properly when exactly one of the sensors has its output equal to 1. An alarm must be raised when two or more sensors have the output of 1. Design the simplest circuit that can be used to raise the alarm.

4. **2.73** Find the minimum-cost circuit consisting only of two-input NAND gates for the function $f(x_1,...,x_4) = \Sigma\ m(0,1,2,3,4,6,8,9,12)$. Assume that the input variables are available in both uncomplemented and complemented forms. (*Hint:* Consider the complement of the function.)

5. **2.75** Find the minimum-cost circuit consisting only of two-input NOR gates for the function $f(x_1, \ldots, x_4) = \Sigma\ m(6, 7, 8, 10, 12, 14, 15)$. Assume that the input variables are available in both uncomplemented and complemented forms. (*Hint:* Consider the complement of the function.)