

EE2000 Assignment 1

Question 1

Simplify the following logic function $Z = (A + \bar{B} + \bar{C})(A + \bar{B}C)$ with Boolean algebra.

Question 2

Find the POS form for logic function $f(a,b,c,d) = \sum m(0,1,2,5,8,9) + \sum dc(4,11,12)$. Implement the circuit with NAND gate only.

Question 3

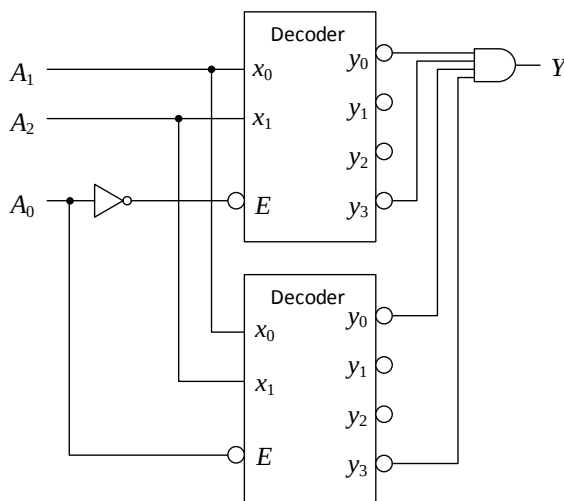
Use Q-M method to minimize function $F : F(A, B, C, D) = \sum m(0,1,2,3,5,7,8,10,12,13,15)$.

Question 4

Use 74LS138 to design the circuit for $f(a,b,c) = a'b + ab' + ac$.

Question 5

Determine the logic function of the following circuit: $F(A_2, A_1, A_0)$

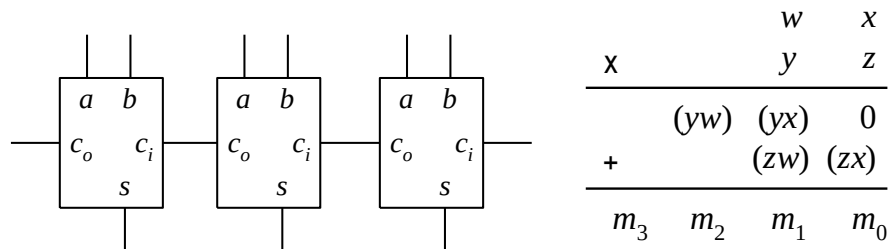


Question 6

Given a logic function $f(a,b,c,d) = \sum m(0,1,2,3,6,7,8,9,14,15)$. Design the circuit using (i) 74LS138 3-to-8 decoder(s), (ii) 74LS153 (MUXs), and (iii) 74LS158 (MUXs).

Question 7

A 3-bit full-adder circuit shown below is used to multiply two 2-bit numbers. The computation of the product is as follow:



Determine the logic functions for all inputs and outputs. Draw the circuit based on the above adder circuit.

Question 8

Draw the timing diagram of the following circuit. Assuming that the initial conditions for y_1y_2 are “00” and both SET and CLR are tied to LOW. Draw the output for y_1 and y_2 .

