

ICS # HW 8

Problem 8.1

a) Truth Table.

i_3	i_2	i_1	i_0	y_1	y_0	y
0	0	0	0	0	0	0
0	0	0	1	0	0	1
0	0	1	0	0	1	1
0	0	1	1	0	1	1
0	1	0	0	1	0	1
0	1	0	1	1	0	1
0	1	1	0	1	0	1
0	1	1	1	1	0	1
1	0	0	0	1	1	1
1	0	0	1	1	1	1
1	0	1	0	1	1	1
1	0	1	1	1	1	1
1	1	0	0	1	1	1
1	1	0	1	1	1	1
1	1	1	0	1	1	1
1	1	1	1	1	1	1

$$b) \quad i_3, i_2, i_1, i_0 = A, B, C, D$$

$$Y_1 = (A + B)$$

$$Y_2 = (\bar{B}C + A)$$

$$Y = (A + B) + (C + D)$$

$$\rightarrow Y_1 = (i_3 + i_2)$$

$$Y_0 = (\neg i_3 \times i_1) + i_3$$

$$Y = i_3 + i_2 + i_1 + i_0$$

- c) i_3 triggers all three outputs to 1
 i_2 triggers Y_1 and Y tells whether one of the output is true or not.
 i_1 triggers Y_0 and again Y tells that at least one output is giving true value.

$$i_3 \rightarrow \text{All}$$

$$i_2 \rightarrow Y_1$$

$$i_1 \rightarrow Y_0$$

$$i_0 \rightarrow \text{only checks } Y$$

$$Y \rightarrow \text{tells if any ~~given~~ input is true or not.}$$