EMTR-2011: Microcontrollers and Digital Logic

Assignment 2

Due date: 1:00pm, Oct. 8, Tuesday.

Question 1

Construction the Karnaugh maps based on the following truth tables and derive the circuit outputs.

(a)

X 1	X 2	<u>x</u> ₃	<u>X</u> 4	f
$ \begin{array}{c} x_1 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 1 \\ 1 \end{array} $	$\frac{x_2}{0}$	0	0	1
0	0	0		0
0	0 0 0	1	1 1	1
0	0	1	0	1
0	1	0	0	0
0	1	0	1	0
0	1	1	1	1
0	1 0	1	1 0 0	1
1	0	0	0	1
1		0	1	0
1	0 0 0	1	1	0
1	0	1	0	1
1	1	0	0	0 1 0 0
1 1	1	0	1	0
1	1	1	0	0
1	1	1	1	1

(b)

<u>x</u> 1	<u>x</u> 2	<u>x</u> 3	<u>X</u> 4	\underline{f}
0	0	0	0	1
0	0	0	0 1	1
$ \begin{array}{c} x_1 \\ 0 \\ 0 \\ 0 \end{array} $	$ \begin{array}{c} x_2 \\ 0 \\ 0 \\ 0 \\ 0 \end{array} $	$ \begin{array}{c} x_3 \\ 0 \\ 0 \\ 1 \end{array} $	1	f 1 1 0 0
0	0	1	0	0
0 0 0	1	1 0 0 1		1 0 0 0 0 1 1
0	1	0	0 1 1 0	1
0	1	1	1	0
0	1	1	0	0
1	0	0	0	0
1	0	0	1	0
1 1 1	0 0 0 0	0 0 1	1 1 0	1
1	0	1	0	1
1	1	0	0	1
1	1	0		1
1 1	1 1	0 0 1 1	1 0 1	1 1
1	1	1	1	1

Question 2

Problem 5.1

Question 3

Problem 5.2

Question 4

Problems 1-12, 1-29 in Chapter 1

Question 5

Problems 2-11, 2-19, 2-25, 2-26