Honors Homework 2

Morally Due Mon Feb 14 at 9:00 AM. Dead Cat Feb 16 at 9:00 Am
COURSE WEBSITE:
`http://www.cs.umd.edu/~gasarch/COURSES/752/S22/index.html`
(The symbol before gasarch is a tilde.)

1. (20 points) Consider the following table

X	Y	Z	Output
0	0	0	1
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	0

   (a) (10 points) Draw the k-map for the table.

   (b) (10 points) Give the simplified expression from the k-map.

2. (30 points) Consider the following table

X	Y	Z	Output
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

   (a) (10 points) Draw the k-map for the table.

   (b) (10 points) Give the simplified expression from the k-map.

   (c) (10 points) Give the expression in terms of exclusive-or.

3. (20 points) Consider the following table

W	X	Y	Z	Output
0	0	0	0	1
0	0	0	1	0
0	0	1	0	1
0	0	1	1	0
0	1	0	0	0
0	1	0	1	1
0	1	1	0	0
0	1	1	1	1
1	0	0	0	1
1	0	0	1	0
1	0	1	0	1
1	0	1	1	0
1	1	0	0	0
1	1	0	1	1
1	1	1	0	0
1	1	1	1	1

(a) (10 points) Draw the k-map for the table.

(b) (10 points) Give the simplified expression from the k-map.

4. (10 points) In recitation, the SR Latch was made up of two NOR Gates. Draw an SR Latch with NAND and NOT gates.

5. (10 points) When D = 1 and the clock = 0 what does the clocked D latch produce?

6. (10 points) How many AND gates are in a 16-bit register made up of flip-flops?