Huddle Board Exercise for Module 2 – No. 1
Monday, February 17, 2014

Draw the **AND-OR** realization and the **NAND-NAND** realization of the following function:

$$F(X,Y,Z) = X' \cdot Y \cdot Z + X \cdot Z' + Y' \cdot Z$$

Draw the **OR-AND** realization and the **NOR-NOR** realization of the following function:

$$F(X,Y,Z) = (X+Y'+Z) \cdot (X'+Y) \cdot (Y+Z')$$

Huddle Board Exercise for Module 2 – No. 1a
Monday, February 17, 2014

1. **Assuming that *only true* variables are available, realize the function F(X,Y,Z) mapped below three different ways:**
   (a) **Using only 7400 (quad 2-input NAND) chips**
   (b) **Using only 7402 (quad 2-input NOR) chips**
   (c) **Using only 7403 (quad 2-input open-drain NAND) chips**

	X′		X	
Z′	1	d	0	1
Z	1	0	0	0
	Y′	Y		Y′

Show complete schematics for each realization, along with your derivations.

2. **Equipped only with a bucket full of 2-input NAND gates (plus a breadboard, some wires, some SPST switches, an LED, some resistors, and a power supply), you must implement the function represented by the ON SET $\sum_{X,Y,Z}(0,1,7)$ as efficiently and quickly as possible.** ***Show all of your work, plus a <u>complete</u> schematic (including the switches, resistors, LED, and however many 2-input NAND gates deemed necessary).***

Huddle Board Exercise for Module 2 – No. 1b
Monday, February 17, 2014

Practice for standardized exam questions — determine the <u>one</u> best response.

The following K-map applies to questions 1 through 6:

	X′		X	
Z′	1	1	0	d
Z	0	0	1	0
	Y′	Y		Y′

1. Assuming the availability of **only true** input variables, the **fewest number of 2-input NAND gates** that are needed to realize this function is:
   (A) 6 (B) 7 (C) 8 (D) 9 (E) none of the above

2. Assuming the availability of **only true** input variables, the **fewest number of 2-input NOR gates** that are needed to realize this function is:
   (A) 6 (B) 7 (C) 8 (D) 9 (E) none of the above

3. Assuming the availability of **only true** input variables, the **fewest number of 2-input open-drain NAND gates** that are needed to realize this function is:
   (A) 6 (B) 7 (C) 8 (D) 9 (E) none of the above

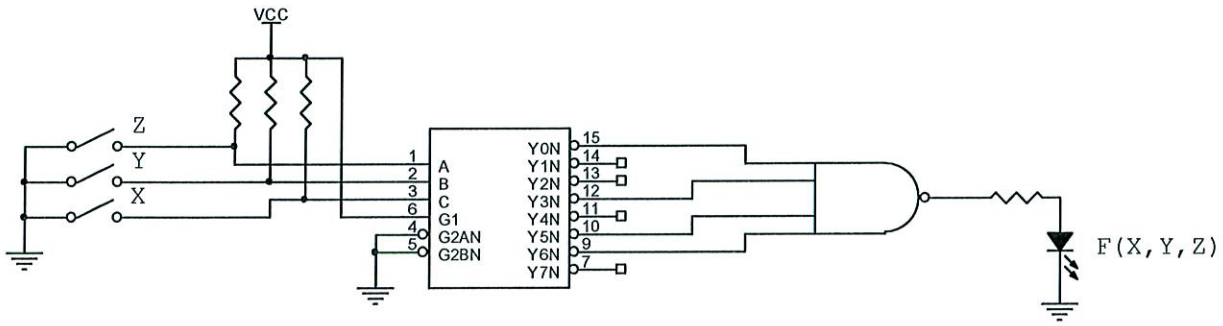
4. The **number of pull-up resistors** required for realizing this function as described in **question 3, above,** is:
   (A) 1 (B) 2 (C) 3 (D) 4 (E) none of the above

5. The **cost** of a **minimal sum of products** realization of this function (assuming **<u>both</u> true and complemented variables** are available) would be:
   (A) 9 (B) 10 (C) 11 (D) 12 (E) none of the above

6. The **cost** of a **minimal products of sum** realization of this function (assuming **<u>both</u> true and complemented variables** are available) would be:
   (A) 9 (B) 10 (C) 11 (D) 12 (E) none of the above

Huddle Board Exercise for Module 2 – No. 2
Wednesday, February 26, 2014

Determine the **ON set** and a simplified **minimum sum-of-products** function realized by this decoder-based circuit.



Determine the **ON set** and a simplified **minimum sum-of-products** function realized by this decoder-based circuit.