

Quiz 1 – Spring 2011 – EECS 270

Name: KEY username: KEY

This quiz is graded out of 100 points. Please remember you can drop your lowest quiz score. You will have 20 minutes for the quiz. It is closed book and closed notes. Show your work and circle your answer!

1. Convert the following to canonical product-of-sums using any method.

$F = (A+A'B')(A+C)$ [30]

A	B	C	$A+\bar{A}\bar{B}$	$A+\bar{C}$
0	0	0	1	1
0	0	1	1	0
0	1	0	0	1
0	1	1	0	0
1	0	0	1	1
1	0	1	1	0
1	1	0	1	1
1	1	1	1	0

$(A+B+\bar{C}) \cdot (A+\bar{B}+C) \cdot (A+\bar{B}+\bar{C})$

$A+\bar{A}\bar{B} \leftrightarrow A+\bar{B} \leftrightarrow (A+\bar{B}+C) \cdot (A+\bar{B}+\bar{C})$

$A+\bar{C} \leftrightarrow (A+B+\bar{C}) \cdot (A+\bar{B}+\bar{C})$

$(A+\bar{A}\bar{B})(A+\bar{C}) \leftrightarrow (A+\bar{B}+C) \cdot (A+\bar{B}+\bar{C}) \cdot (A+B+\bar{C})$

way 2

2. What is the range of representation for the following schemes? Also, for each scheme indicate how you would represent -4 using that scheme (or write "no representation if it can't be represented.")

[25 points, -2 per wrong or blank answer, min 0]

- a. 3-bit 2's complement 3 to -4 -4 is 100
- b. 4-bit signed magnitude 7 to -7 -4 is 1100
- c. 5-bit unsigned 31 to 0 -4 is no representation

3. Write a logic equation for a circuit which takes 3 inputs (A,B,C) and generates a one if, and only if, exactly two of the three inputs are a one. [20]

$$(A \cdot B \cdot \bar{C}) + (A \cdot \bar{B} \cdot C) + (\bar{A} \cdot B \cdot C)$$

4. Complete the following timing diagram for an SR-latch with enable. [25]

If the value is unknown (or oscillating) at some point, clearly indicate that with hashes (like this)

