Cpr E 281 HW01 ELECTRICAL AND COMPUTER ENGINEERING IOWA STATE UNIVERSITY

Initial Stuff and Basics Assigned Date: First Week Not Graded, Finish by Sep. 3, 2014

- P1. (12 points) Define the following terms in no more than 2 sentences each.
 - A. CAD
 - B. PCB
 - C. PLD
 - D. FPGA
- P2. (12 points) In the development process initial design-simulation-verification is one loop and prototype implementation-testing-verification is another loop. Answer the following in 4-5 sentences.
 - A. Which loop is relatively more expensive, and why?
 - B. Can any of these loops be avoided? If not, why not? If yes, what is the penalty?
- P3. (8 points) Convert the following numbers to decimal:
 - a) 1101001₂
 - b) 1101₂
 - c) 1101₈
 - d) 1101₁₆
- P4. (8 points) Convert the following numbers to binary:
 - a) 45
 - b) 281
 - c) 281₁₆
 - d) CAD_{16}
- P5. (20 points) Consider the following statement: "If any of my two friends picks me up in time and the movie is not sold out or my friend who picks me up has already bought tickets then I will see the movie tonight." Suppose the events that your two friends pick you up on time are represented by logic variables A and B, respectively, for the two friends; their having bought tickets in advance are represented by logic variables T1 and T2, respectively; the movie being sold out is represented by the logic variable S, then write down all combinations of logic variables (like X=1 and Y=0) one at a time, which when true will allow you to see the movie.
- P6. (20 points) Consider the logic function f(x, y) = x + (x.y).
 - A. (8 points) Draw the circuit diagram for f(x, y).
 - B. (8 points) Write the truth table for f(x, y).
 - C. (4 points) By looking at the truth table in (b), what observation can you make about f(x, y)?

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- P7. (20 points) Consider the circuit below. Name the three inputs as A, B, and C and name the output as F.
 - A. Write the logic expression for it.
 - B. Write the truth table for the circuit.

