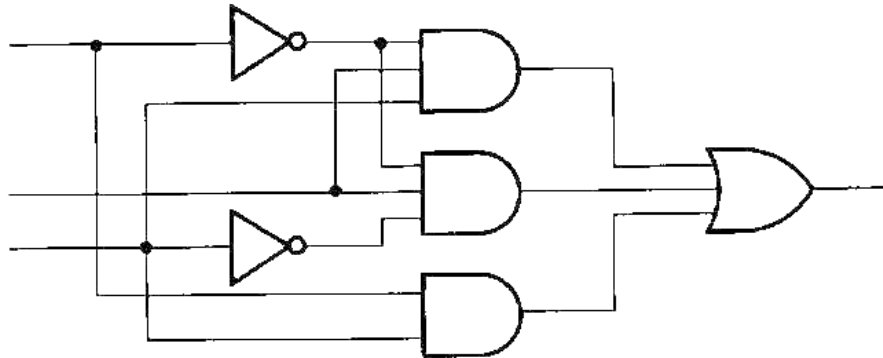


- P1. (10 points) Define the following terms in no more than 2 sentences each.
- A. CAD
 - B. PCB
 - C. PLD
 - D. FPGA
- P2. (10 points) In the development process initial design-simulation-verification is one loop and prototype implementation-testing-verification is another loop. Answer the following 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. (10 points) Convert the following numbers to decimal:
- a) 1111010_2
 - b) 1011_2
 - c) 1110_8
 - d) 1111_{16}
 - e) BEE_{16}
- P4. (10 points) Convert the following numbers to binary:
- a) 43
 - b) 101
 - c) 281
 - d) 381_{16}
 - e) $BEEF_{16}$
- 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 $f(x, y) = y + (x \bullet y)$.
- 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 $f(x, y)$?

P7. (10 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.



P8. (10 points) Consider the circuit below.

- A. Write the logic expression for the output F.
- B. Write the truth table for the circuit.

