

CSI 250 - HW 2 - SPRING 2010

1. Use a Karnaugh map to simplify: $A\bar{B}\bar{C} + \bar{A}BC + AB\bar{C} + \bar{A}\bar{B}\bar{C}$
2. Use a K-map to find a simple expression for $f(A, B, C, D)$. f is 1 when two or more inputs are 1 and 0 otherwise.
3. Use a K-map to find a simple expression for $f(A, B, C, D)$. f is 1 when precisely two inputs are 1. When three or four inputs are 1, then the result does not matter. The function is 0 otherwise.
4. A logic circuit has three inputs a, b , and c that represent numbers from 0 to 7. The outputs of the circuit are u, v, w, x, y , and z and these represent the square of the input. Write the 6 truth tables for u, v, w, x, y , and z . Use a K-map to simplify the y and z terms (and other terms if you like).
5. Briefly describe the utility (usefulness) of a PLA.
6. If the clock has a cycle time of 1 nanoseconds per cycle, then what is the corresponding clock rate in megahertz.
7. A flip-flop can be used save state. What is the reason for having a master-slave flip-flop?
8. Draw the diagram for a D flip-flop. Describe how it works.