Logic design (2018 FALL)
Quiz # 8

Name:_____ID:_____

1. (100%) Given the following logic function.

$$F(A, B, C, D) = \sum m(2,3,6,7,8,9,13,15)$$

(a)(20%) Find a minimum OR-AND circuit for F. Note that you don't need to draw the OR-AND circuit. Listing the corresponding Boolean expression for the circuit would be enough.

(b)(30%) Assuming that only one input signal can change each time, identify all pairs of input patterns that may result in static-0 hazards. Note that you only need to list the pairs of input patterns. The order of the patterns in a pair doesn't matter.

(c)(50%) Find an OR-AND circuit for F which has no static-0 hazards. Note that you don't need to draw the OR-AND circuit. Listing the corresponding Boolean expression for the circuit would be enough.

Ans:

CD \ AB	00	01	11	10
00	0	0	0	1
01	0	0	1	1
11	1	1	1	0
10	1	1	0	0
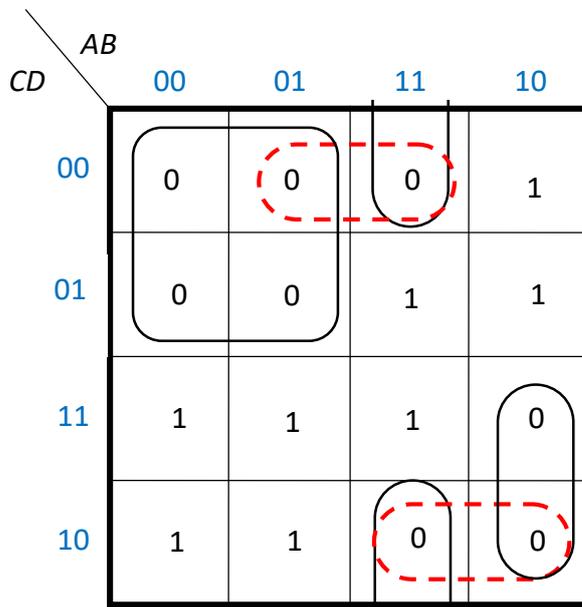
(a) F = (A + C)(A′ + B′ + D)(A′ + B + C′)

(b) (A,B,C,D): (0,1,0,0) -> (1,1,0,0)
    (A,B,C,D): (1,0,1,0) -> (1,1,1,0)

(c) F = (A + C)(A′ + B′ + D)(A′ + B + C′)(B′ + C + D)(A′ + C′ + D)