Quiz 3

Q1. Given $f(a, b, c, d) = \Sigma m(2, 3, 8, 9, 12, 13)$

a) Using K-map, what is the minimum number of loops for SOP

cd \ ab	00	01	11	10
00	0	0	1	1
01	0	0	1	1
11	1	0	0	0
10	1	0	0	0

⇒ 2 loops

b) What is the number of loops for SOP if those loops contain:

- 1 minterm: 0
- 2 minterms: 1
- 4 minterms: 1

c) Is it true that the expression above only has exactly one minimum canonical SOP? 0 for False and 1 for True

True

cd \ ab	00	01	11	10
00	0	0	1	1
01	0	0	1	1
11	1	0	0	0
10	1	0	0	0

d) What can be a product for SOP for the above expression?

a'bc' | a'b'c | ab'c' | None of above

Q2.

The correct segment g should be denoted by this expression

seg[6] = `x[1]&~x[0]|x[3]&~x[2]|x[3]&x[0]|~x[2]&x[1]|~x[3]&x[2]&~x[1];`

A student write it wrongly into this

`x[1]|x[3]&~x[2]|x[3]&x[0]|~x[2]&x[1]|~x[3]&x[2]&~x[1];`

Suppose the circuit is implement successfully without any error. What number will be displayed wrongly?

Only 5, 7, E | **Only 7** | Only 5, E | Only E

Q3. What is the segment that is not lighted up when the number 4 is displayed?

a, d, e,

Inputs x[3:0] Hexadecimal digits (binary)	Display	Active High Outputs seg[0:6] Segments (1: on, 0: off)						
		a	b	c	d	e	f	g
0 (0000)	0	1	1	1	1	1	1	0
1 (0001)	1	0	1	1	0	0	0	0
2 (0010)	2	1	1	0	1	1	0	1
3 (0011)	3	1	1	1	1	0	0	1
4 (0100)	4	0	1	1	0	0	1	1
5 (0101)	5	1	0	1	1	0	1	1
6 (0110)	6	1	0	1	1	1	1	1
7 (0111)	7	1	1	1	0	0	0	0
8 (1000)	8	1	1	1	1	1	1	1
9 (1001)	9	1	1	1	1	0	1	1
A (1010)	A	1	1	1	0	1	1	1
b (1011)	b	0	0	1	1	1	1	1
C (1100)	C	1	0	0	1	1	1	0
d (1101)	d	0	1	1	1	1	0	1
E (1110)	E	1	0	0	1	1	1	1
F (1111)	F	1	0	0	0	1	1	1