CSE 232 - HW1

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1.)

F(x, y, z) = xy + x'z + yz

= xy + x'z + yz(x + x')

= xy + x'z + xyz + x'yz

= xy(1 + z) + x'z(1 + y)

= xy + x'z

2.)

(x + y)(x' + z)(y + z) = (x + y)(x' + z)

x	y	z	x'	x + y	x' + z	y + z	(x + y)(x' + z)(y + z)	(x + y)(x' + z)
0	0	0	1	0	1	0	0	0
0	0	1	1	0	1	1	0	0
0	1	0	1	1	1	1	1	1
0	1	1	1	1	1	1	1	1
1	0	0	0	1	0	0	0	0
1	0	1	0	1	1	1	1	1
1	1	0	0	1	0	1	0	0
1	1	1	0	1	1	1	1	1

Their outputs are equal.

3.)

a.)

A	B	C	D	Minterm	Maxterm
0	0	0	0	A’B’C’D’ = m0	A + B + C + D = M0
0	0	0	1	A’B’C’D = m1	A + B + C + D’ = M1
0	0	1	0	A’B’CD’ = m2	A + B + C’ + D = M2
0	0	1	1	A’B’CD = m3	A + B + C’ + D’ = M3
0	1	0	0	A’BC’D’ = m4	A + B’ + C + D = M4
0	1	0	1	A’BC’D = m5	A + B’ + C + D’ = M5
0	1	1	0	A’BCD’ = m6	A + B’ + C’ + D = M6
0	1	1	1	A’BCD = m7	A + B’ + C’ + D’ = M7
1	0	0	0	AB’C’D’ = m8	A’ + B + C + D = M8
1	0	0	1	AB’C’D = m9	A’ + B + C + D’ = M9
1	0	1	0	AB’CD’ = m10	A’ + B + C’ + D = M10
1	0	1	1	AB’CD = m11	A’ + B + C’ + D’ = M11
1	1	0	0	ABC’D’ = m12	A’ + B’ + C + D = M12
1	1	0	1	ABC’D = m13	A’ + B’ + C + D’ = M13
1	1	1	0	ABCD’ = m14	A’ + B’ + C’ + D = M14
1	1	1	1	ABCD = m15	A’ + B’ + C’ + D’ = M15

F(A, B, C, D) = B’D + A’D + BD

= B’D(A + A’)(C + C’) + A’D(B + B’)(C + C’) + BD(A + A’)(C + C’)

= AB’CD + A’B’CD + AB’C’D + A’B’C’D + A’BCD + A’B’CD + A’BC’D + A’BC’D

+ ABCD + A’BCD + ABC’D + A’BC’D

= AB’CD + A’B’CD + AB’C’D + A’B’C’D + A’BCD + A’BC’D + ABCD + ABC’D

= m11 + m3 + m9 + m1 + m7 + m5 + m15 + m13

= ε(1, 3, 5, 7, 9, 11, 13, 15)

= M0.M2.M4.M6.M8.M10.M12.M14

= π(0, 2, 4, 6, 8, 10, 12, 14)

b.)

$F(A, B, C, D) = B'D + A'D + BD$

$= D(B' + A' + B)$

$= D(1 + A')$

$= D1$

$=D$