16/01/15

(Lec 14) Min Terms / Max Terms

X	Y	Z	X.Y.Z (anding) (MIN TERM)	X+Y+Z (oring) (MAX TERM)
0	0	0	$m_1 = 0$	$M_1 = 0$
0	0	1	$m_2 = 0$	$M_2 = 1$
0	1	0	$m_3 = 0$	$M_3 = 1$
0	1	1	$m_4 = 0$	$M_4 = 1$
1	0	0	$m_5 = 0$	$M_5 = 1$
1	0	1	$m_6 = 0$	$M_6 = 1$
1	1	0	$m_7 = 0$	$M_7 = 1$
1	1	1	$m_8 = 1$	$M_8 = 1$

note:- (where 0 means x/y/z and 1 means x'/y'/z')

(Practice Questions)

Question:- $f : xy + z$ by min term

[SP is called Sum of Products] $= xy \cdot (z+z') + z \cdot (x+x')$

$= xyz + xyz' + zx + zx'$

$= m_1 + m_2 + (zx + zx') \cdot (y+y')$

[Sum of Min-terms] (or) $= m_1 + m_2 + xyz + xy'z + x'yz + x'y'z$

$= m_1 + m_2 + m_4 + m_5 + m_7$

$= \boxed{m_1 + m_2 + m_3 + m_5 + m_7}$

Question:- $f = x+y$ by min terms

x	y	x-y
0	0	0 = m_1
0	1	0 = m_2
1	0	0 = m_3
1	1	1 = m_4

$= x+y$

$= x(y+y') + y(x+x')$

$= xy + xy' + xy + x'y$

$= xy + xy' + x'y$

$= \boxed{m_1 + m_2 + m_3}$ Ans