PreLab 2

(a)

Input	S_2	S_1	S_0	X_0	X_1	X_2	X_3	X_4	X_5	X_6	Output
0	0	0	0	0	0	0	0	0	1	0	0
1	0	0	1	0	0	1	1	1	1	0	0
2	0	1	0	0	0	0	1	0	0	0	0
3	0	1	1	0	0	0	0	1	0	0	
4	1	0	0	0	0	0	0	1	0	0	
5	1	0	1	1	1	1	1	0	0	1	
6	1	1	0	0	1	1	0	0	0	0	
7	1	1	1	0	1	0	0	1	0	0	
				-	-	-	-	-	0	-	

(b) $X_0 \Rightarrow f = \sum m(5)$

minterms $= S_2 \bar{S}_1 S_0$

$f = \prod M(0,1,2,3,4,6,7)$

maxterms $= (\bar{S}_2+\bar{S}_1+\bar{S}_0)(\bar{S}_2+\bar{S}_1+S_0)(\bar{S}_2+S_1+\bar{S}_0)(\bar{S}_2+S_1+S_0)(S_2+\bar{S}_1+\bar{S}_0)(S_2+\bar{S}_1+S_0)(S_2+S_1+\bar{S}_0)(S_2+S_1+S_0)$

$X_1 \Rightarrow f = \sum m(5,6,7)$

minterms $= S_2\bar{S}_1S_0 + S_2S_1\bar{S}_0 + S_2S_1S_0$

$f = \prod M(0,1,2,3,4)$

maxterms $= (\bar{S}_2+\bar{S}_1+\bar{S}_0)(\bar{S}_2+\bar{S}_1+S_0)(\bar{S}_2+S_1+\bar{S}_0)(\bar{S}_2+S_1+S_0)(S_2+\bar{S}_1+\bar{S}_0)$

$X_2 \Rightarrow f = \sum m(1,5,6)$

minterms $= \bar{S}_2\bar{S}_1S_0 + S_2\bar{S}_1S_0 + S_2S_1\bar{S}_0$

$f = \prod M(0,2,3,4,7)$

maxterms $= (\bar{S}_2+\bar{S}_1+\bar{S}_0)(\bar{S}_2+S_1+\bar{S}_0)(\bar{S}_2+S_1+S_0)(S_2+\bar{S}_1+\bar{S}_0)(S_2+S_1+S_0)$

$X_3 \Rightarrow f = \Sigma m(1,2,5)$

minterms $= \bar{S}_2 \bar{S}_1 S_0 + \bar{S}_2 S_1 \bar{S}_0 + S_2 \bar{S}_1 S_0$

$f = \Pi M(0,3,4,6,7)$

maxterms $= (S_2 + S_1 + S_0)(\bar{S}_2 + \bar{S}_1 + S_0)(\bar{S}_2 + \bar{S}_1 + \bar{S}_0)$
$(\bar{S}_2 + S_1 + \bar{S}_0)(\bar{S}_2 + S_1 + S_0)$

$X_4 \Rightarrow f = \Sigma m(0,1,3,4,7)$

minterms $= \bar{S}_2 \bar{S}_1 \bar{S}_0 + \bar{S}_2 \bar{S}_1 S_0 + \bar{S}_2 S_1 S_0$
$+ S_2 \bar{S}_1 \bar{S}_0 + S_2 S_1 S_0$

$f = \Pi M(2,5,6)$

maxterms $= (\bar{S}_2 + S_1 + \bar{S}_0)(\bar{S}_2 + \bar{S}_1 + S_0)$
$(\bar{S}_2 + S_1 + S_0)$

$X_5 \Rightarrow f = \Sigma m()$

Zero minterms

$f = \Pi M = 1$

$X_6 \Rightarrow$ Same outputs as X_0