CSE 140 HW 5

1) a) $f = 1/T_c$ $T_c \geq (70 + 3(60) + 60 + 0)$ ps

(310) ps

$f = \frac{1}{310} \times 10^{12} = 3.23 \times 10^9$ Hz

b) $50 + 60 \geq 20 + t_{shift}$

$t_{shift} \leq -90$

2) a) $T_c \geq (35 + 85 + 30 + 0)$

(150) ps

$\frac{1}{150} \times 10^{12} = 6.67 \times 10^9$ Hz

b) $25 + 15 \geq 10 + t_{shift}$

$40 \geq 10 + t_{shift}$

$t_{shift} \leq -30$

$35 + 45 + 30 = 30$

(120)

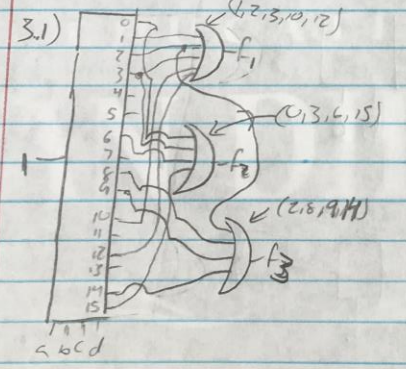
$\frac{1}{120} \times 10^{12} \Rightarrow 8.33 \times 10^9$ Hz

3) $f_1(a,b,c,d) = \sum m(1,2,3,10,12) + \sum d(5,8)$

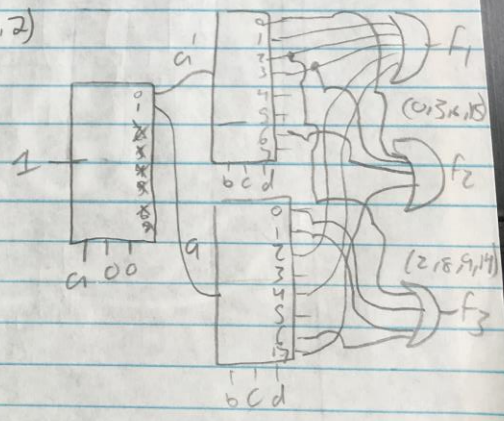
$f_2(a,b,c,d) = \sum m(0,3,6,15) + \sum d(2,10)$

$f_3(a,b,c,d) = \sum m(2,8,9,14) + \sum d(11,12,13)$

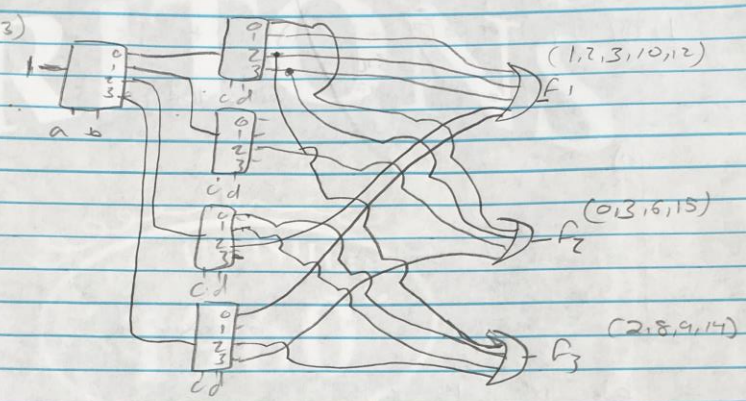
3.1)



3.2)

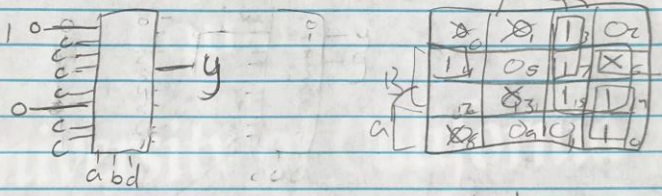


3.3)



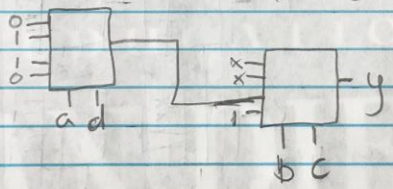
4) $f(a,b,c,d) = \sum m(3,4,7,10,14,15) + \sum d(0,1,6,8,13)$

4.1

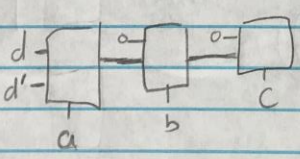


$y = d'cd + bc + acd'$
$= c(a'd + b + ad')$

4.2)

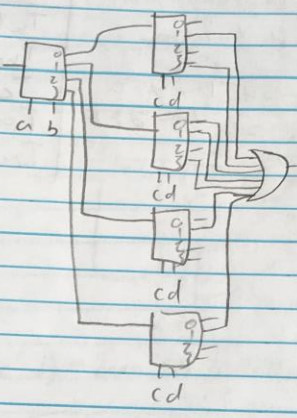


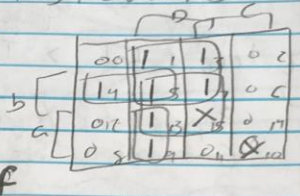
4.3



5) $f(a,b,c,d) = \sum m(1,3,4,5,7,9,13) + \sum d(10,15)$

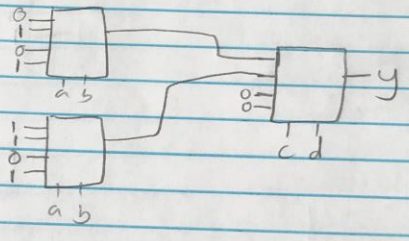
5.1)





$y = a'd + bd + a'bc' + ac'd$
$= d(a' + b + ac') + a'bc'$
$= d(a' + b) + c'(a'b + ab')$

5.2)



5.3)