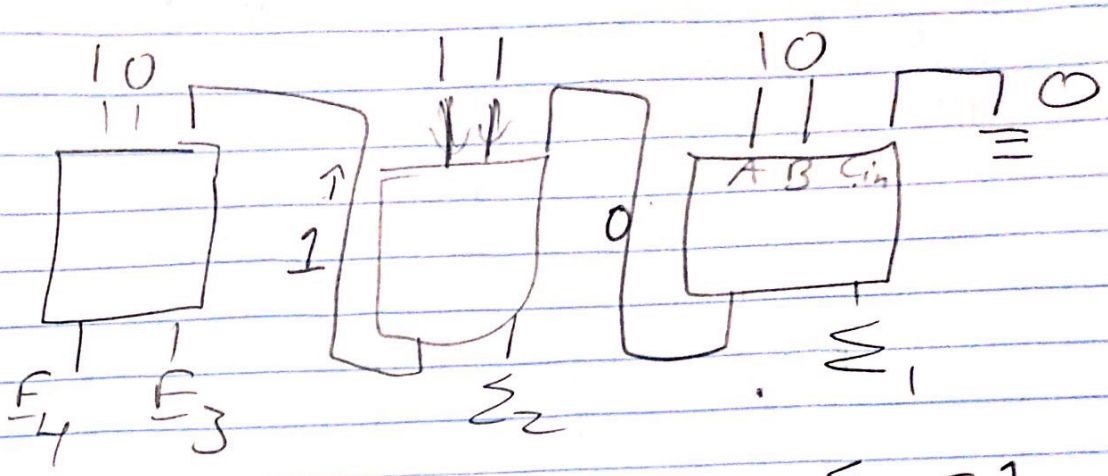
Daniel

Hw #4

Bell

(4)



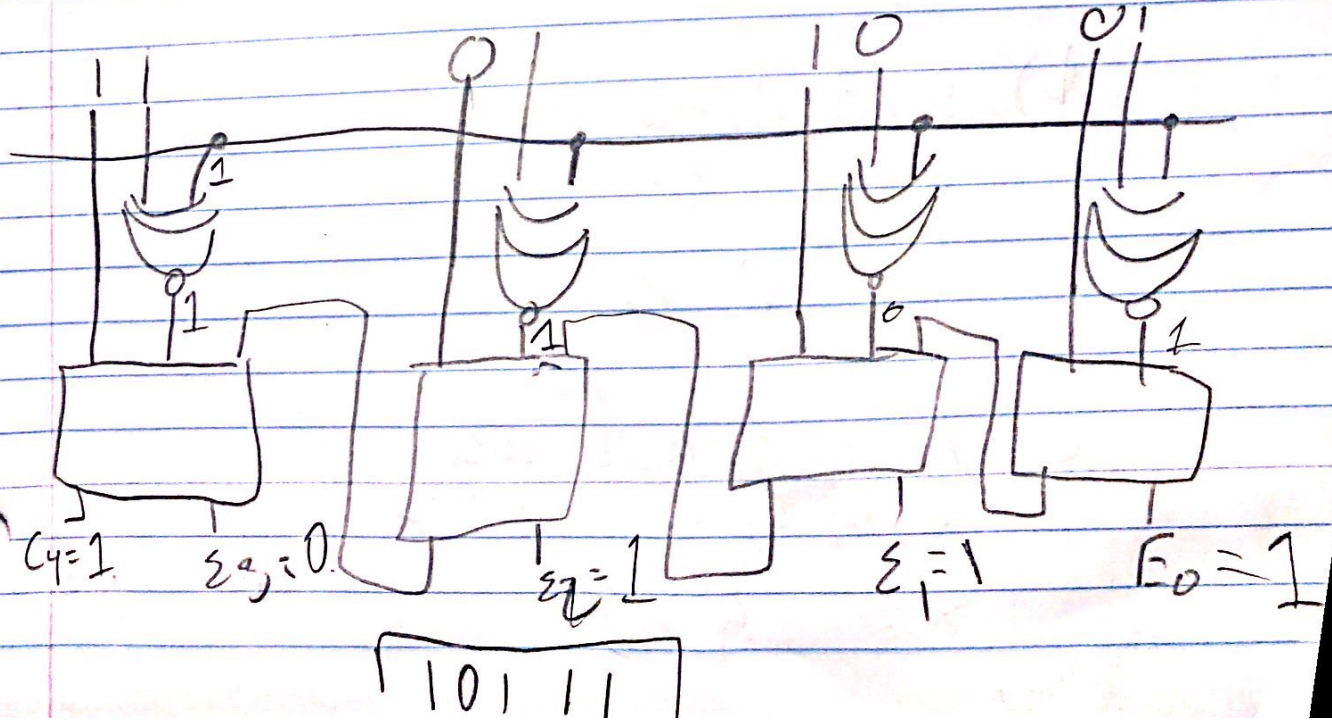
$F_4 = 1 \quad F_3 = 0 \quad F_2 = 0 \quad F_1 = 1$

1001

verify

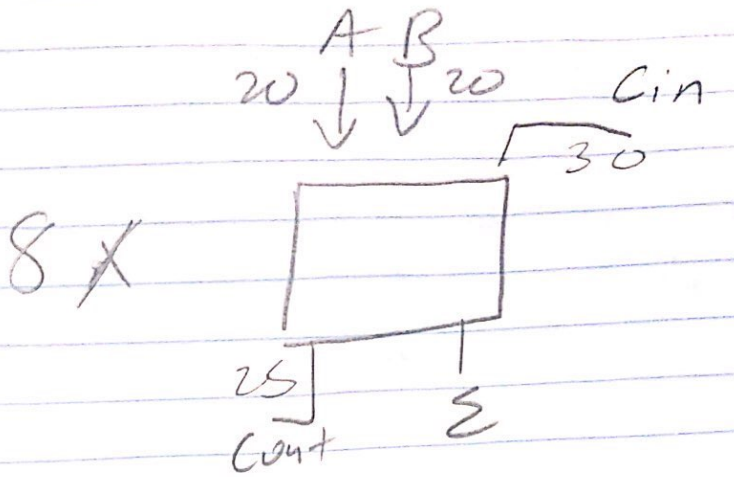
$$\begin{array}{r} 1111 \\ +\ 0110 \\ \hline 1001 \end{array} \checkmark$$

(7) A = 1010 B = 1101 $\overline{\text{Add}}$ / subtract = 1



1011 11

(11) Determine max time between two eight bit numbers (i.e. we need 8 carry each time)



$8 \times 95ns = 760ns$

(15) a) $A_3 A_2 A_1 A_0 = 1010$
$B_3 B_2 B_1 B_0 = 1101$

$X = A < B$

b) $A_3 A_2 A_1 A_0 = 1101$
$B_3 B_2 B_1 B_0 = 1101$

$X = A = B$

c) $A_3 A_2 A_1 A_0 = 1001$
$B_3 B_2 B_1 B_0 = 1000$

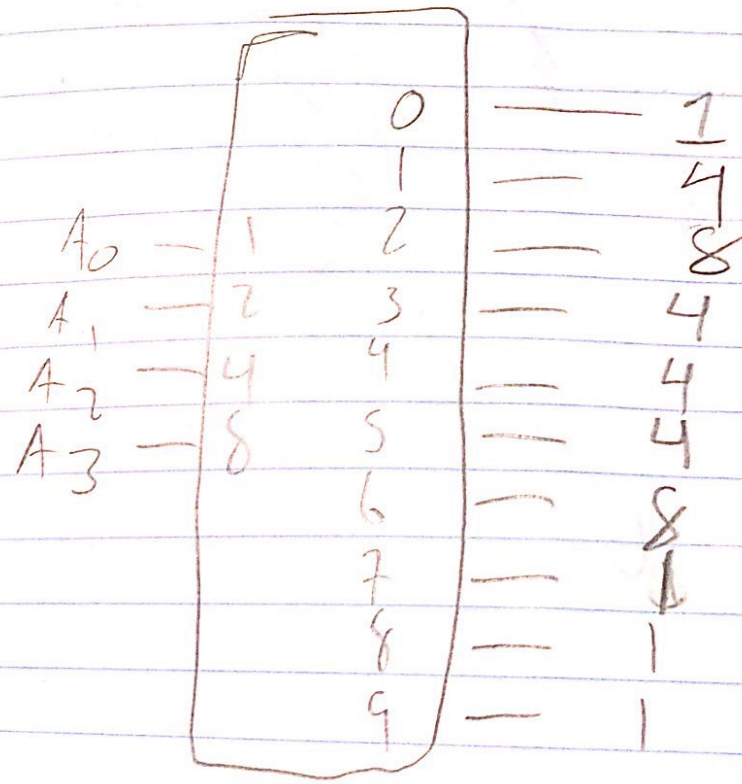
$X = A > B$

(20)

SOP Expression

$$(\bar{A}_0 A_1 A_2) + (A_0 \bar{A}_1 A_2) + (A_0 A_1 \bar{A}_2)$$

21



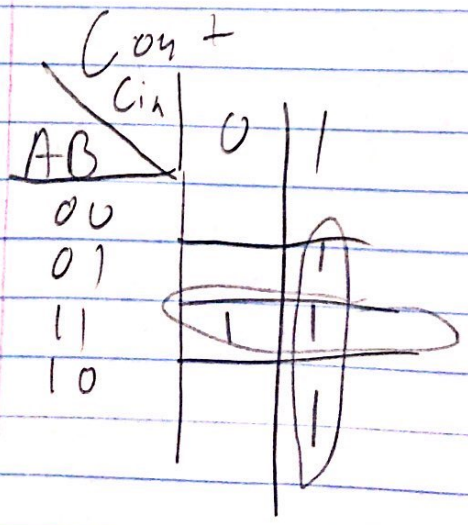
23 The output code is 9 which is not a BCD code.

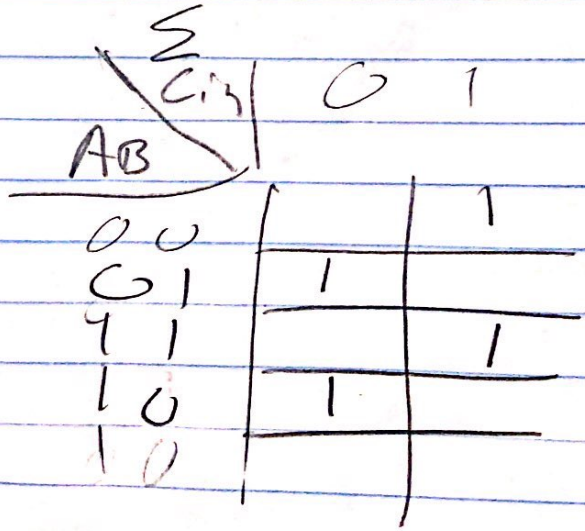
29 $Y = D_0 D_2 P_1 P_3 P_3 D_1 P_2 D_0 P_1 D_2 D_3 D_0$

34 It seems as though the sigma waveform is wrong it doesn't follow the truth table

C_{n-1}	A_n	B_n	Σ_n	C_n
0	0	0	0	0
0	0	1	1	0
0	1	0	1	0
0	1	1	0	1
1	0	0	1	0
1	0	1	0	1
1	1	0	0	1
1	1	1	1	1

45 refer to table above





Therefore

$$C_{out} = AB + AC_{in} + BC_{in}$$

$$= AB + C_{in}(A + B)$$

and

$$\Sigma = \bar{A}B\bar{C}_{in} + A\bar{B}\bar{C}_{in} + \bar{A}\bar{B}C_{in} + ABC_{in}$$