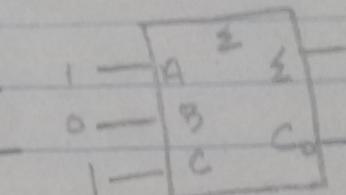
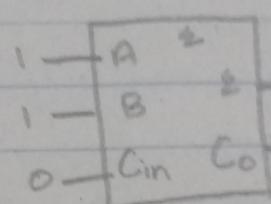
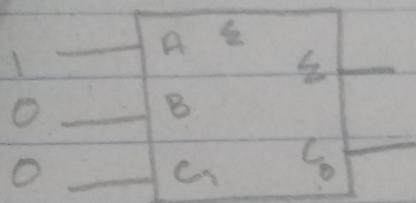


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Assignment 1March 23rdArithmetic and Logic Unit Design Chapter

Question 6-1

For each of 3 FAs, determine the outputs
for inputs shown.

Sol

a- The input bits are $A=1$, $B=0$, $C_i=0$
 $1+0+0 = 1$ without carry.
 $S=1$ and $C_{out}=0$.

b-

The input bits are $A=1$, $B=1$, $C_i=0$.
 $1+1+0 = 0$ with a carry 1
 $\text{So, } S=0, C_0=1$

c- The input bits are $A=1$, $B=0$, $C_{in}=1$
 $1+0+1 = 0$ with carry 1
 $\text{So, } S=0, C_0=1$

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Determine the sum and opt carry of a half adder for each input bits.

a 01

$$\begin{array}{l} S = 1 \\ C_0 = 0 \end{array}$$

b 00

$$\begin{array}{l} S = 0 \\ C_0 = 0 \end{array}$$

c 10

$$\begin{array}{l} S = 1 \\ C_0 = 0 \end{array}$$

d 11

$$\begin{array}{l} S = 0 \\ C_0 = 1 \end{array}$$

A full adder has $C_{in}=1$. What are the sum and C_0 when $A=1$, $B=1$

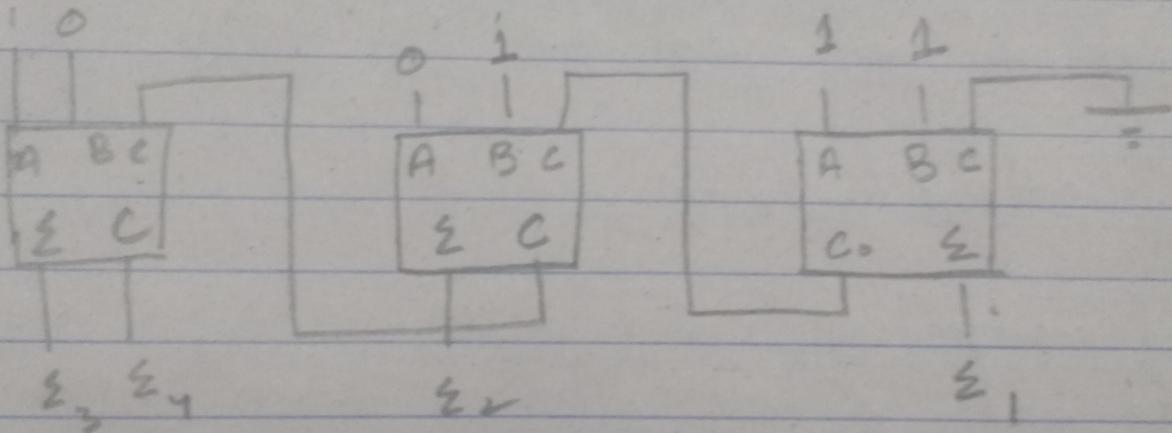
So

$$Sum = S = 1$$

$$C_{out} = 1$$

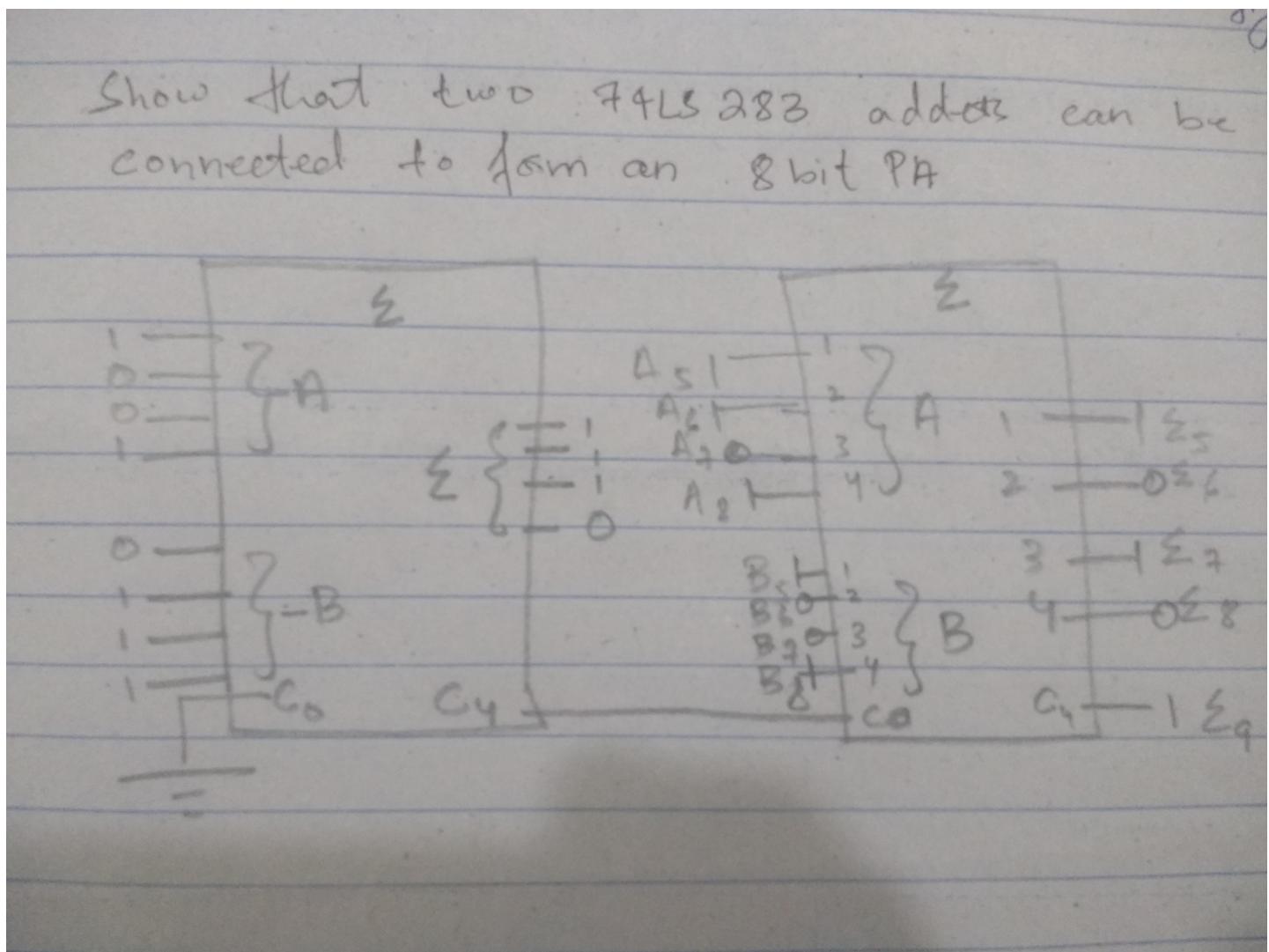
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Determine the sum generated by 36 PA and show carries.



The LSB of two numbers are added in the right most FA. The sum bits and the intermediate carries are in fig

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Two 4bit numbers (1101 and 1011) are applied to a 4bit PA. The int carry is 1. Determine the sum and opt carry.

$$\text{Carry } \Sigma_3 \Sigma_2 \Sigma_1 = 110\ 01$$

How many 74LS283 adders would be reqd to add 2 binary nums each representing dec. nums up through 100^0_{10} ?

Two 74LS283s are required to add.

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The input bids to a FA are 10. Find C_g CP.

$$C_g = 0$$

$$C_p = 1$$

Determine the Cout of FA when $C_{in} = 1, C_g = 0, C_p = 1$

$$\text{Cont 2}$$

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Add the binary numbers

$$\begin{array}{r}
 01010111 \\
 + 00110101 \\
 \hline
 10001100
 \end{array}$$

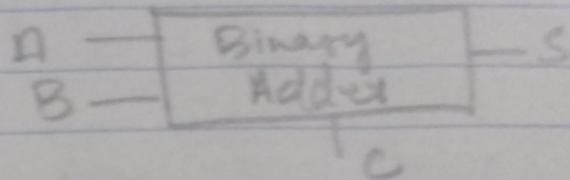
In Hex

5F

$$\begin{array}{r}
 3S \\
 \hline
 8C
 \end{array}$$

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If 2 ipds are A; B. Find opt.



$$\begin{array}{r}
 \begin{array}{cccc} 0000 & 0001 & 0000 & 1100 \\ + 0000 & 0000 & 0100 & 1001 \\ \hline 0000 & 0001 & 0101 & 0101 \end{array}
 \end{array}$$

what's the 2s complement of A. 0011 01010100

$$A' = 1100\ 1010\ 0110\ 0100$$

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Add these 8 bits numbers.

a 0001 0000 and 0000 1000

0001 1000 , 18H

b 0001 1000 and 0000 1100

0010 0100 , 24H

c 0001 1100 and 0000 1110

~~0010~~ 1010 , 2AH

d 0010 1000 and 0011 1011

0110 0011 , 63H

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Convert binary to do addition
write answers in Hex.

a $2CH + 4FH$

$$\begin{array}{r} 2CH \\ + 4FH \\ \hline 7BH \end{array}$$

b $SEH + 1AH$

$$\begin{array}{r} SEH \\ + 1AH \\ \hline 78H \end{array}$$

c $3BH + 6DH$

$$\begin{array}{r} 3BH \\ + 6DH \\ \hline A8H \end{array}$$

d $ASH + 2CH$

$$\begin{array}{r} ASH \\ + 2CH \\ \hline D1H \end{array}$$

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Convert int decimal equiv.

a 0001 1110

+30

b 1000 0111

-7

c 1001 1100

-28

d 0011 0001

+49

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+ + +

Find 2's complement

a 0000 0111

F9H

d 1110 0001

1FH

b 1111 1111

01H

c 1111 1101

03H

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An 8 bit up uses 2's complement rep
How do the following nums appear?

a -19

1110 1101 , EDH

b -48

1101 0000 , D0H

c +37

0010 0101 , 25H

d -33

1101 1111 , DFH

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Suppose the input are A=3CH and B=5FH.
What's the opt low low SUB? fig 6.9.

Low SUB 9BH

High SUB DDH