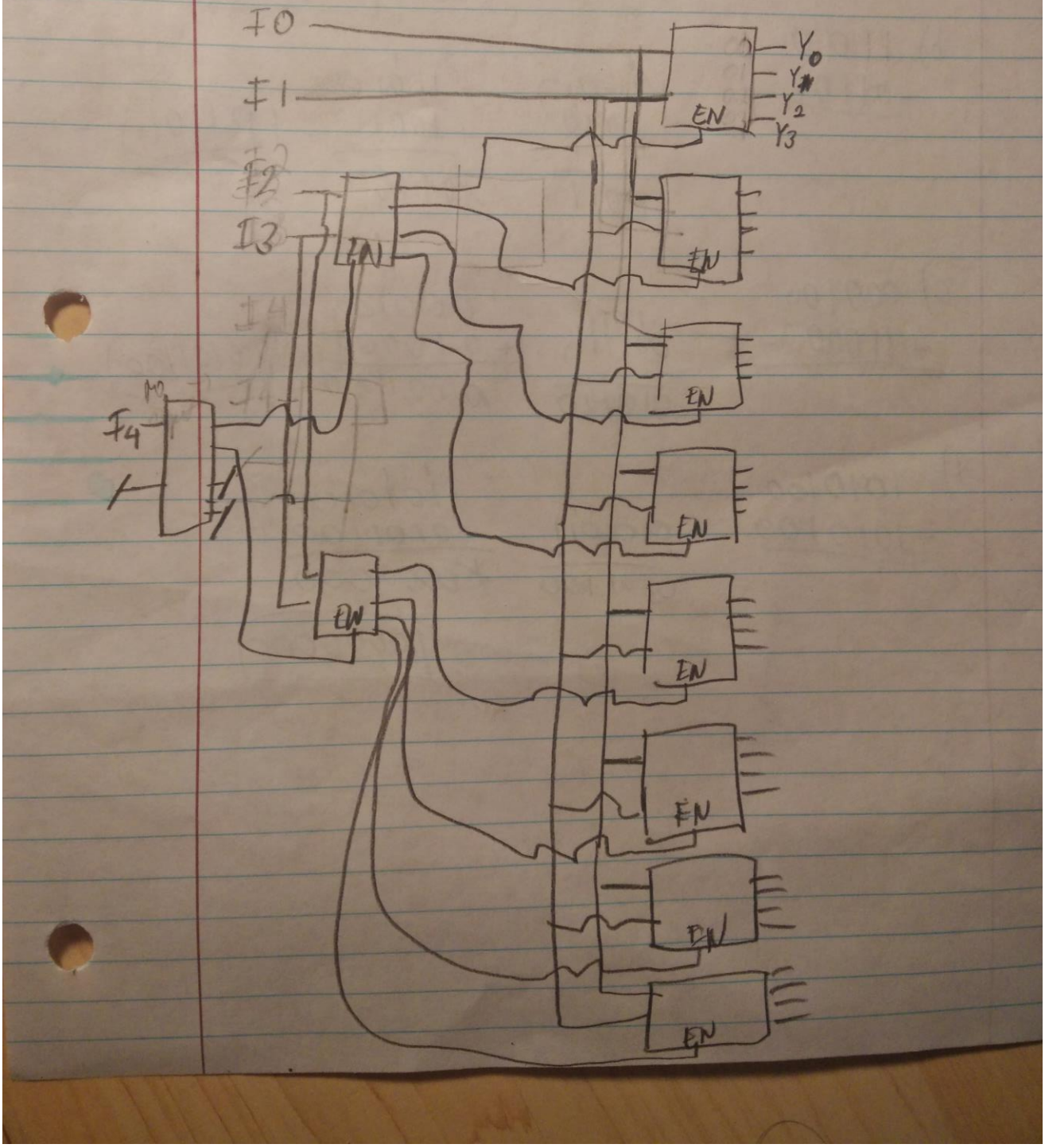
1. Design a 5 to 32 decoder using 2 to 4 decoders.

5 inputs $2^5 = 32$ outputs



2.

a) 11010
−10000 →

01111
+ 1
10000

11010
+10000
101010

01010

b) 1190
−01101

01101 → 10010
+ 1
10011

11010
+10011
101101

01101

c) 000100
−110000

001111
+ 1
010000

000100
+010000
010100

0101100

d) 1010100
−1010100

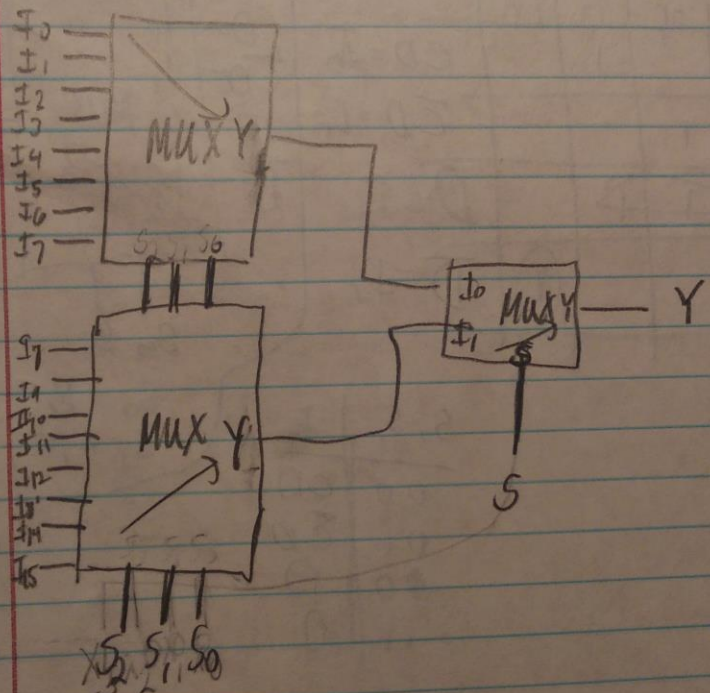
0101011
+ 1
0101100

1111
1010100
+0101100
10000000

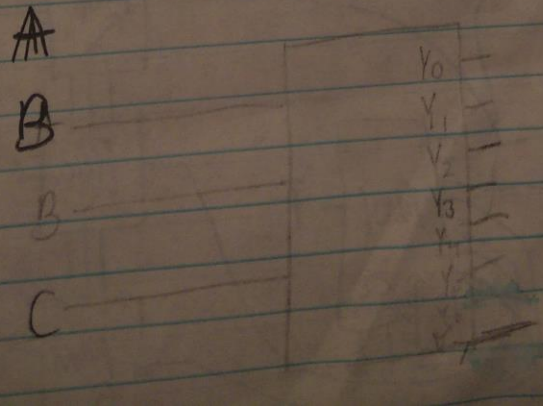
0000000

3b

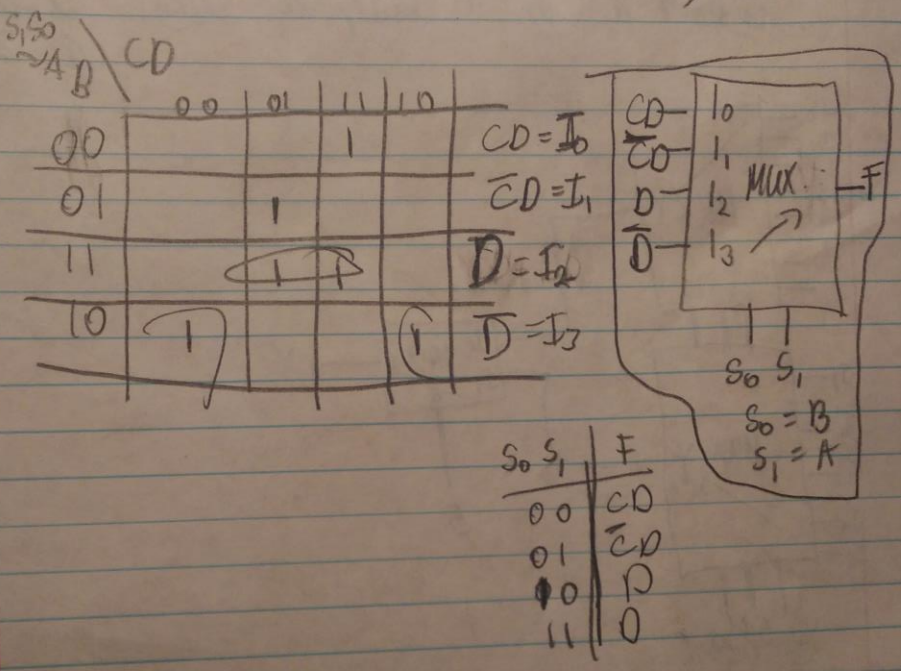
1. Construct a 16-1 multiplexer using 2 8-1s & 1 2-1s.



2. Use a decoder to implement $f(A,B,C) = A \oplus B \oplus C$

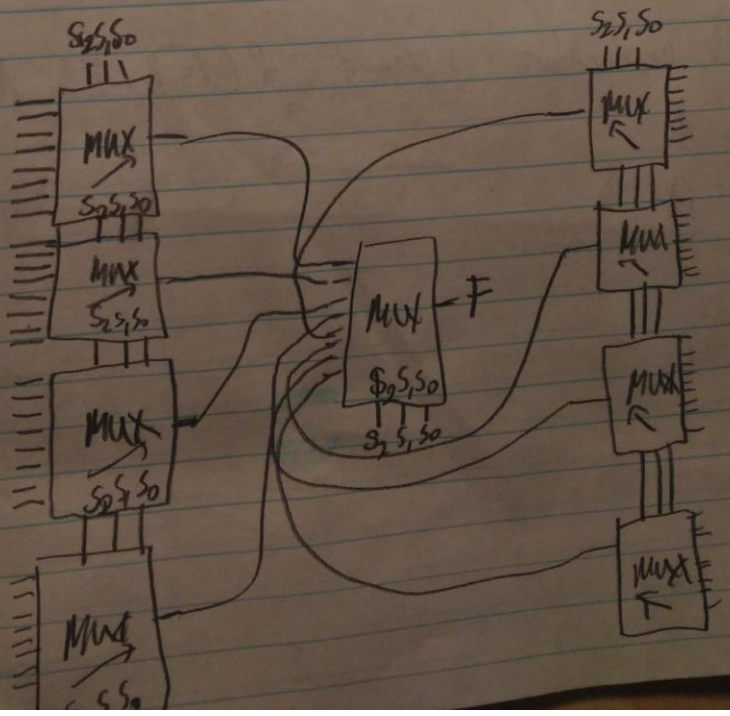


3. $F(A,B,C,D) = \Sigma(3,5,8,10,13,15)$



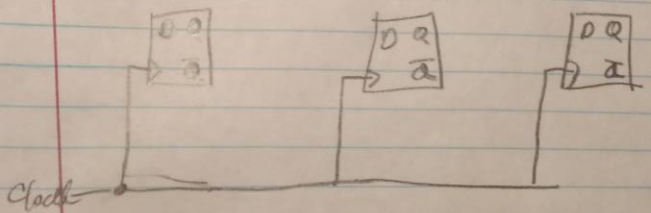
S_0 S_1	F
0 0	CD
0 1	$\bar{C}D$
1 0	D
1 1	0

4.

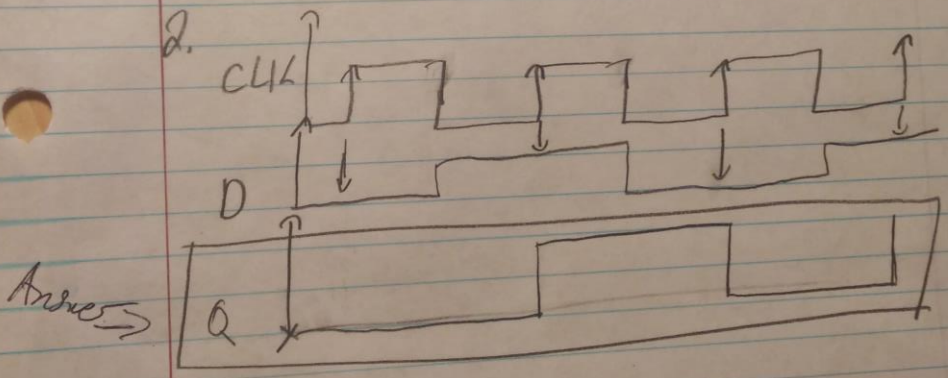


3c

1. Design a 3-bit binary up counter by D flip-flops



2.



3.