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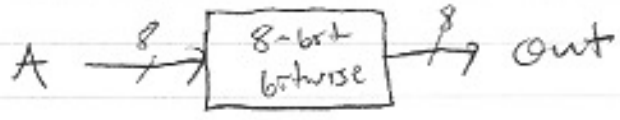
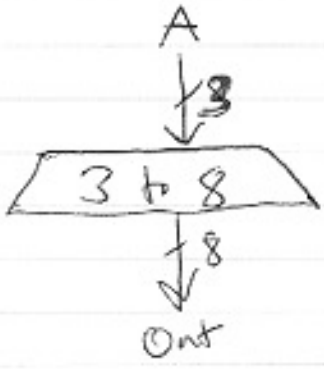
Digital Logic: Asn 3

Problem set:
Ch.3: 1, 4-11

1)



4)



5) Function table

A	Out[7:0]
0	10000000
1	01000000
2	00100000
3	00010000
4	00001000
5	00000100
6	00000010
7	00000001

6) 2 to 1 mux on 4-bit

Function table

A	B	sel	Out
X	Y	0	X
X	Y	1	Y

7)

a) k = 10110111 , op = 00

= 10110111

b) k = 10110111 , op = 01

```
  10110111
+ 00000001
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  10111000
```

= 10111000

c) k = 10110111 , op 10

= 01001000

d) k = 10110111 , op 11

```
invert
01001000
       + 1
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```
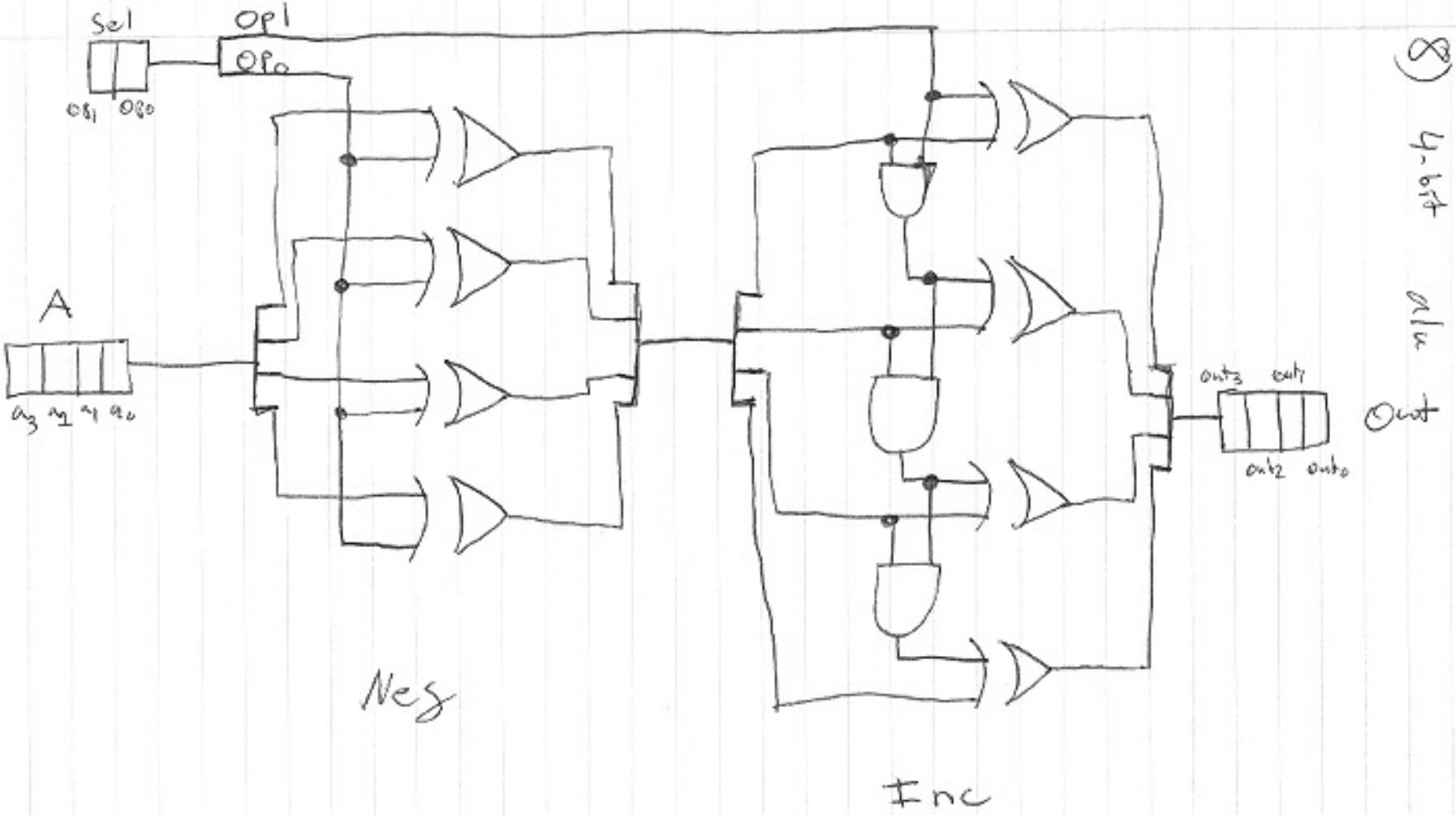

= 01001001


Sel
Op1
Op0
Sel1 Sel0
A
a3 a2 a1 a0
Neg
Inc
out3 out1
out2 out0
Out

(8) 4-bit alu

9)

A3	A2	A1	A0	Op
~~W~~	X	Y	Z	00
W	X	Y	Z	01
W	X	Y	Z	10
W	X	Y	Z	11

10) You would need 4 select bits, with Sel_3 being undefined, which means that output should never be seen.

Function table

A	B	C	Sel	Out
X	Y	Z	00	X
X	Y	Z	01	Y
X	Y	Z	10	Z
X	Y	Z	11	'undefined'

11) You'd need 3 select bits for a 8 to 1 mux.
A Mux component is used to implement an 8 to 1 multiplexer.