

## HOMEWORK 1

1. (a) BIN: 10101101  
HEX: 0xAD  
BCD: 0001 0111 0011
  
- (b) BIN: 0111111  
HEX: 0x7F  
BCD: 0001 0010 0111
  
- (c) BIN: 01010100  
HEX: 0x54  
BCD: 0110 1000
  
2. (a) HEX: 0x69  
DEC: 105  
BCD: 69
  
- (b) HEX: 0x48  
DEC: 72  
BCD: 48
  
- (c) HEX: 0x5E  
DEC: 94 BCD: N/A
  
3. (a)

$$A = W'X'Y' + W'X'Y + W'XY' + WX'Y' + WX'Y + WXY'$$

$$B = W'X'Y + W'XY + WX'Y + WXY'$$

$$C = W'XY' + W'XY + WX'Y' + WX'Y$$

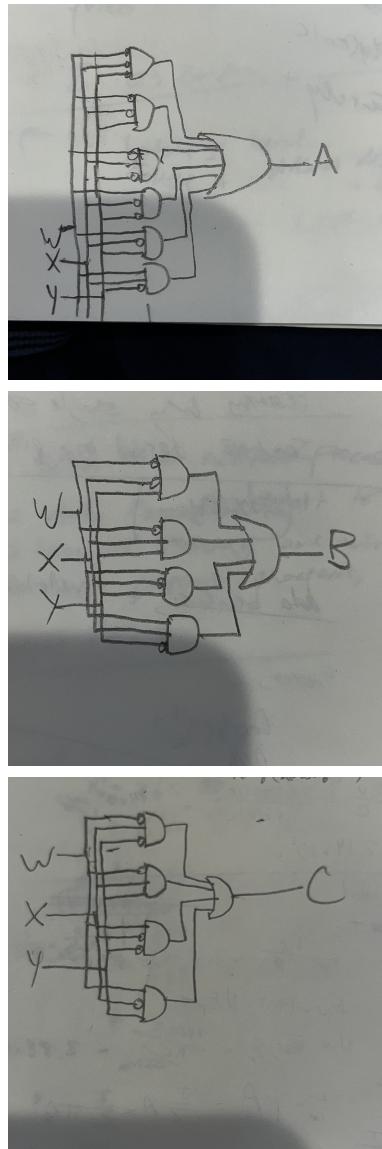


Figure 1: Unimplified Logic Circuits

(b)

$$\begin{aligned}A &= W'X'Y' + W'X'Y + W'XY' + WX'Y' + WX'Y + WXY' \\&= (X'Y' + X'Y + XY')(W + W') \\&= X'(Y' + Y) + XY' \\&= X' + Y'\end{aligned}$$

$$\begin{aligned}
 B &= W'X'Y + W'XY + WX'Y + WXY' \\
 &= Y(W'X' + W'X + WX') + WXY' \\
 &= Y(W' + X') + WXY' \\
 &= W'Y + X'Y + WXY'
 \end{aligned}$$

$$\begin{aligned}
 C &= W'XY' + W'XY + WX'Y' + WX'Y \\
 &= W'(XY' + XY) + W(X'Y' + X'Y) \\
 &= W'X + WX'
 \end{aligned}$$

(c)

$$C = W \oplus X$$

4.

A	B	C	D	X
0	0	0	0	1
0	0	0	1	1
0	0	1	0	1
0	0	1	1	1
0	1	0	0	0
0	1	0	1	1
0	1	1	0	0
0	1	1	1	0
1	0	0	0	0
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	0
1	1	0	1	1
1	1	1	0	0
1	1	1	1	0