

- 4) Represent 8 bit numbers  
 in (a) Signed Magnitude  
 (b) Signed one's complement  
 (c) Signed 2's complement

(a) -22

$$(a) -22 = 10010110$$

$$\begin{array}{r} \cancel{2} \cancel{2} \\ \cancel{2} \cancel{1} 0 \\ \cancel{2} \cancel{5} 1 \\ \cancel{2} \cancel{1} \\ 1 0 \end{array}$$

(b) ~~1011001~~

$$1^s \text{ complement} = 1\cancel{0}1101001$$

$$(c) 2^s \text{ complement} = 1\cancel{0}1101001$$

$$1\cancel{0}1101001$$

(b) -55

$$(a) 10110111$$

$$\begin{array}{r} \cancel{5} \cancel{5} \\ \cancel{2} \cancel{7} \\ 1 \cancel{3} 1 \end{array}$$

$$(b) 1^s \text{ complement} = 1\cancel{0}1001000$$

$$\begin{array}{r} 6 7 \\ 3 1 \\ 1 \end{array}$$

2's complement =

$$\begin{array}{r} 1 \oplus 1001000 \\ \hline 1 \oplus 1001001 \\ \hline \end{array}$$

b) -34

a)  $= 1 \oplus 0100010$

$$\begin{array}{r} 34 \\ \hline 170 \\ \hline 81 \\ \hline 10 \\ \hline 0 \end{array}$$

~~1's complement~~

$$= \cancel{10}100010$$

$$\cancel{10100011}$$

b) 1's complement =  $\cancel{10}1011101$

c) 2's complement =  $\cancel{10}1011101$

~~1011101~~

$$\underline{\quad \quad \quad \quad \quad \quad \quad \quad}$$
  
$$1 \oplus 1011101$$

q) -67

(a) 11000011  
=

$$\begin{array}{r} & 67 \\ \times & 331 \\ \hline & 161 \\ & 80 \\ & 40 \\ \hline & 20 \end{array}$$

b) 1's complement

= 10011100 10

c) 2's complement

10011100

1

10011101

—  
—