COMP 3350 Project 1

1.) A. $0110\ 0001\ 1111_2 \rightarrow \boxed{61F_{16}}$

B. $1000\ 1111\ 1100_2 \rightarrow \boxed{8FC_{16}}$

C. $0001\ 0110\ 0100\ 0101_2 \rightarrow \boxed{1645_{16}}$

2.) a) Signed Magnitude

1.) $1100\ 1010_{sm} = \boxed{-74_D}$

2.) $1111\ 0010_{sm} = \boxed{-114_D}$

3.) $1000\ 0111_{sm} = \boxed{-7_D}$

b.) One's Complement Representation

1.) $1100\ 1010_{1's} = 1011\ 0101_{sm} = \boxed{-53_D}$

2.) $1111\ 0010_{1's} = 1000\ 1101_{sm} = \boxed{-13_D}$

3.) $1000\ 0111_{1's} = 1111\ 1000_{sm} = \boxed{-120_D}$

c.) Two's Complement Representation

1.) $1100\ 1010_{2's} = 1100\ 1001_{1's} = 1011\ 0110_{sm} = \boxed{-54_D}$

2.) $1111\ 0010_{2's} =$ ~~1111 1111~~ $1111\ 0001_{2's} = 1000\ 1110_{sm} = \boxed{-14_D}$

3.) $1000\ 0111_{2's} = 1000\ 0110_{1's} = 1111\ 1001_{sm} = \boxed{-121_D}$

3.) a.) Signed Magnitude Representation

1.) $-100_d = 1110\ 0100_{s\_m}$

2.) $-16_d = 1001\ 0000_{s\_m}$

3.) $-21_d = 1001\ 0101_{s\_m}$

4.) $-0_d = 1000\ 0000_{s\_m}$

b.) One's Complement Representation

1.) $-100_d = 1001\ 1011_{1's}$

2.) $-16_d = 1110\ 1111_{1's}$

3.) $-21_d = 1110\ 1010_{1's}$

4.) $-0_d = 1111\ 1111_{1's}$

3.) c.) Two's Complement Representation

1.) $-100_d = 1001\ 1100$ 2's

2.) $-16_d = 1111\ 0000$ 2's

3.) $-21_d = 1110\ 1011$ 2's

4.) $-0_d = 0000\ 0000$ 2's

4.) a.) $0000000 \rightarrow 1111111 =$ **0_D to 127_D**

b.) $1111111 \rightarrow 0111111 =$ **-63_D to 63_D**

5.) 1.) $1000 \wedge 1110 =$ **1000**

2.) $1000 \vee 1110 =$ **1110**

3.) $(1000 \wedge 1110) \vee (1001 \wedge 1110) = 1000 \vee 1000 =$ **1000**

COMP 3350

Project 1

6.) $25_D - 65_D \rightarrow 25_D + (-65)_D \rightarrow 0001\ 1001_{sm} + 1100\ 0001_{sm}$

$\rightarrow 0001\ 1001_{1's} + 1011\ 1110_{1's} \rightarrow$

$$\begin{array}{r} 0001\ 1001_{2's} \\ +\ 1011\ 1111_{2's} \\ \hline \end{array}$$

$$\boxed{1101\ 1000_{2's}}$$

7.) $1101\ 1000_{2's} \rightarrow$

$$\begin{array}{r} 1101\ 1000_{2's} \\ -\ \quad\quad\quad 1 \\ \hline 1101\ 0111_{1's} \end{array}$$

$1101\ 0111_{1's} \rightarrow 1010\ 1000_{sm} \rightarrow \boxed{-40_D}$

$-(32 + 8)$