

King Fahd University of Petroleum & Minerals
Department of Electrical Engineering

EE200-(01/03)

(101)



Homework # 2

1. Perform the following arithmetic operations:

i. $(175.4 + 234.6)_8 = 432.2_8$

ii. $(1101.101 - 110.01)_2 = 111.011_2$

iii. $(8A5.9 - F.8)_{16} = 896.1_{16}$

2. Perform the following binary subtractions using the 2's complement:

i. $11010.11 - 1101.001$
 $11010.110 \rightarrow 11010.110$
 $- 01101.001 \rightarrow +10010.111$

End Carry (ignore)

101101.101

ii. $100100 - 110010$
 $100100 \rightarrow 100100$
 $- 110010 \rightarrow +001110$

No end Carry
 Answer is negative
 = - 001110

110010

3. Convert the decimal numbers -94 and +45 to binary using 10 bit signed 2's complement representation, then obtain the sum $(-94) + (+45)$ in binary and convert the result to decimal.

$94 = 64+16+8+4+2 \rightarrow 1011110$

$+94 \rightarrow 0001011110$

$- 94 \rightarrow 1110100010$ *****

$45 = 32+8+4+1 \rightarrow 101101$

$+45 \rightarrow 0000101101$ *****

No end Carry
 Answer is negative
 = - 0000110001 $\rightarrow -49$

1111001111

4. Represent the decimal number 2965 in binary, BCD, and ASCII with 8 bits, where the 8th bit is an even parity bit. Express the ASCII code in Hexadecimal form.

$2965 = 2048 + 512 + 256 + 128 + 16 + 4 + 1 = 2^{11} + 2^9 + 2^8 + 2^7 + 2^4 + 2^2 + 2^0$

$\rightarrow 101110010101$ binary

$\rightarrow 0010\ 1001\ 0110\ 0101$ BCD

$\rightarrow 1011\ 0010\ 0011\ 1001\ 0011\ 0110\ 0011\ 0101$ ASCII (8 bits)

$\rightarrow B\ 2\ 3\ 9\ 3\ 6\ 3\ 5$ ASCII(Hex.)