EEL 3701C - Digit Logic & Computer Systems

Homework I

(Total: 40 Pts)

The homework must be solved individually. We use software to automatically detect cheating.
***Any case of cheating will lead to grade 0 for this homework**.*

Carefully provide the different steps of your solution for each problem

Due Sunday, September 18, 11:59PM

Problem I (Number Conversion, 8 Pts)

Convert using **Horner Scheme**

a) 563_7 to Base 9 **(2 Pts)**
b) 435_6 to Base 8 **(2 Pts)**

Convert using **successive integer divisions**

c) 412_7 to Base 3 **(2 Pts)**
d) $6A_{13}$ to Base 6 **(2 Pts)**

Problem II (Binary Operation 14 Pts)

Add, subtract, and multiply in Binary

a) 5 and 17 **(2 Pts)**
b) 75 and 54 **(2 Pts)**
c) 44 and 36 **(2 Pts)**

Divide in Binary up to 3 digits after the comma.

d) 541/5 **(4 Pts)**
e) 122/ 14 **(4 Pts)**

Problem III (Complement Representation 12 Pts)

Add the following numbers in binary using 2's complement to represent negative numbers. Use a word length of 6 bits (including sign) and indicate if an overflow occurs.

a) (-5) + (-11) **(2 Pts)**
b) (-4) + (-8) **(2 Pts)**
c) (–9) + (–14) **(2 Pts)**

Repeat a) b) and c) using 1's complement to represent negative numbers **(6 Pts)**

Problem IV (6 Pts)

Convert the floating-point number pairs into the 32-bits floating-point representation taught in the class. Then perform addition and multiplication operation. Report the results in decimal.

a) $(2.125)_{10}$, $(1.75)_{10}$