

Homework Assignment #2**Assigned:** 30/10/2020**Due:** 06/11/2020, 23:55**Notes:**

- Submit your homework on SUCourse+. You can write on paper, take a picture and upload it on SUCourse+.
- Show your solutions clearly.

1. Assume that you are using 4 digit 2's complement binary system. Do the following arithmetic operations and detect overflows. **(12 pts)**

	0011	0101	0111	0011
	+ 0100	+ 1110	- 1111	- 1111
Result	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Overflow?	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

2. Perform the following operations on two signed decimal numbers by representing them as 8-bit signed numbers in 2's-complement format and performing binary addition/subtraction. Show all the intermediate steps and indicate whether there is an overflow or not. **(14 pt)**

-106 →		+95 →	
+ +81 →	+	- -53 →	+

3. For the Boolean function $F(x,y,z) = x'y + xy'z + z'$,
- Generate the truth table. **(15 pts)**
 - Draw the circuit implementing Boolean function $F(x,y,z)$. **(15 pts)**
4. Use DeMorgan's Theorem to simplify the Boolean function $F(x, y, z) = ((x + yz)' + (xy'))'$. **(14 pts)**
5. Implement the Boolean function $F(x, y, z, t) = xy + zt + x'y't'$ using only two-input NOR gates. **(15 pts)**
6. Implement the Boolean function $F(x, y, z, t) = (x \oplus y')(z' \oplus t')$ using only two-input NAND gates. **(15 pts)**