Midterm exam DITE: Wednesday, Oct 23, 2013 -- 10:00 to 13:00h

Task I: Simplify the Boolean function **F**(W,X,Y,Z) = ∑m(1,2,4,5,6,8,9) which has the don't-care conditions **d**(W,X,Y,Z) = ∑m(10,11,15) by finding all prime implicants and essential prime implicants and applying the selection rule. Note that function **F** has ***don't care*** conditions **d** that you have to take into account when simplifying function **F**. After you have simplified the function, represent it using the **logic basis NOR**. Also, draw the combinational logic circuit corresponding to the function **using only 2-input NOR gates.**

Important: Show all prime implicants and essential prime implicants as well as explain all the steps you do to simplify and represent function F.

Task II: Implement Boolean function **F**(W,X,Y,Z) given in **Task I** using **only** 4-to-1 Multiplexers with enable and 1-to-2 Decoders without enable and one OR gate.

Important: Show and explain all the steps you do to implement **F**(W,X,Y,Z).

Task III: Implement a binary Full Adder using **only** 1-to-2 Decoders with enable and OR gates.

Important: Show and explain all the steps you do to implement the Full Adder.