

Systems Engineering Department
SE 311: Design of Digital Systems
Term 041 Dr. Al-Amer Quiz 2

Name : _____ ID#: _____

Instructions: Answer all questions and show all details

[Question1]

Design a logic circuit that implement the function below using 3X16 decoders and 4-input NOR gates only.

$$F(w,x,y,z) = \Sigma(1,2,4,5,6,11,12,13,14,15).$$

[Question 2]

Design a combinational logic circuit that takes three inputs A_2, A_1, A_0 and produce one output Y . $Y = 1$ if and only if $1 < (A_2 A_1 A_0) < 7$. Show all steps of the design.

[Question 3]

Using Full adders and NAND gates only design a circuit that can add and or subtract two 2-bit numbers. Inputs to the circuit are 4 bit data (2X2-bit numbers) and 1-bit operation(add/subtract). Outputs are the two bit answer (Hint ignore carry/borrow).