

Digital System Design - Diagnostic Pretest

Name: _____ Course: _____ SSN: _____

Table 1: Prerequisites by Courses (or Equivalent)

Course Number	Taken at	Term/Year	Grade
CEG 260 Switching Circuits			

Grading: This quiz will not count in the determination of your final grade. It is designed to quantify a percentage of your knowledge of prerequisite course material. The feedback provided by this quiz may help you gauge your readiness for this course as well as provide information necessary to the continuous quality improvement of the digital design sequence.

Difficulty:

- D1: The quiz was not difficult.
- D2: The quiz covers material learned before and recalled with some difficulty.
- D3: The quiz covers material learned before, but not easily recalled.
- D4: The quiz covers unfamiliar material.

Recall:

- R1: Prerequisite material is well understood, review was unnecessary.
- R2: The discussion of prerequisite material was well understood.
- R3: The discussion of prerequisite material was mostly understood.
- R4: The discussion of prerequisite material was not understood.

1. *Boolean Algebra* (T/F). Indicate whether each of the following Boolean equations is true or false. There are two possible ways of solving each problem: (a) use Boolean algebra to manipulate the expressions; or (b) write a Karnaugh map or truth table for both sides of the equation and compare.

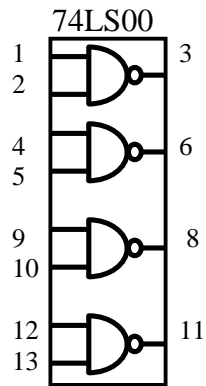
___ (a) $(W'X + YZ)' = (W + X')(Y' + Z')$

___ (b) $WX' + WX'YZ = WX' + YZ$

___ (c) $W'X + W'XY = W'X + W'XZ$

2. *Combinational Circuit Synthesis*. Draw a *logic* diagram for the function $F(A,B,C,D,E) = AB(C+D'+E')$ using only 2-input NAND and NOR gates. Use good documentation practices.

3. *Combinational Circuit Synthesis.* Draw a *schematic* diagram implementing a 2-to-1, 1-line multiplexer using a single 74LS00. Use good documentation practices.



4. *Combinational Circuit Synthesis.* Implement the function $F = AB' + BC + C'$ using ONLY a multiplexor. You may select a multiplexor of any size, and may use constants and may assume that primary inputs are available in both their normal and complemented form.