ECE 321 – Electronics I
Skills Review Block III (Logic)
Fall 2016

Name _____   Section _____

ACADEMIC SECURITY. This Skills Review is NEVER released from academic security.   **INTEGRITY: Your honor is extremely important. This academic security policy is designed to help you succeed in meeting academic requirements while practicing the honorable behavior our country rightfully demands of its military. Do not compromise your integrity by violating academic security or by taking unfair advantage of your classmates.**

Collaboration Policy: No collaboration allowed. This is individual effort. You may not seek help from other cadets, only DFEC faculty members and other DF faculty members. All help must be properly documented.

Permissible References: Any except a Skills Review from previous semesters.

Grading: The Skills Review will count as two quiz grades.

Overview: This exercise is intended to refresh some of the core concepts you learned in circuits, mathematics, physics and chemistry. These subject areas are relevant to the study of semiconductor devices and their use in electronics. The quality/readability of your work is important and points will be deducted if we cannot understand or read your solutions. You may attach additional pages to this handout if you need more space. Regardless of how you complete the problems, you **must** show your work to receive full credit.

Problem 1 (10 pts) _____ (Block I)   Problem 5 (10 pts) _____ (Block II)

Problem 2 (10 pts) _____ (Block I)   Problem 6 (10 pts) _____ (Block II)

Problem 3 (10 pts) _____ (Block I)   Problem 7 (10 pts) _____ (Block III)

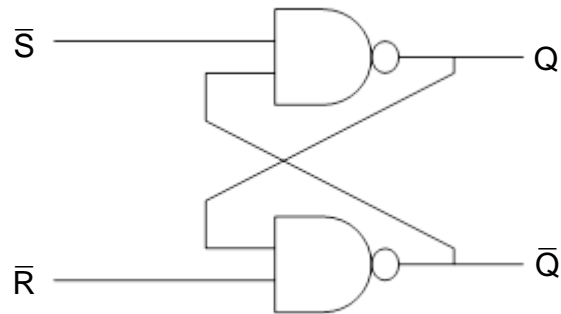Problem 4 (10 pts) _____ (Block II)   Problem 8 (10 pts) _____ (Block III)

Total _____   Grade _____

Problem 7: ECE 281

You are given the following circuit. <u>Determine</u> and <u>explain the function</u> of the circuit. Use timing diagrams, words, truth tables, or whatever else you want to provide your answer explain the relationship between the inputs ($\overline{S}$ and $\overline{R}$) and the outputs (Q and $\overline{Q}$).

Problem 8: ECE 281

Implement the following Boolean function using only NAND gates. Remember that a NAND gate is nothing more than an AND gate with its output inverted. You may use ground and VDD as needed.

DRAW the schematic for the function F and also for its complement F´.

$$F = BC + A$$

INPUTS

A

OUPUTS

F

B

C

F´