

Name _____ Student ID _____ Colleges & Schools _____ Department _____

Pretest for Midterm Examination

1. Factor to obtain a product of sums. (Simplify where possible.)

$$A'C'D' + ABD' + A'CD + B'D$$

2. A switching circuit has three inputs (A, B, C) and one output (F) and is given by

$$F(A, B, C) = A + B'C' + BC$$

- (a) Find the truth table for F.
- (b) Find the minterm and maxterm expansion for F in algebraic and decimal forms.
- (c) Find the minterm and maxterm expansion for F' in decimal form.

3. For this function, find a minimum sum-of-products solution, using the Quine-McCluskey method.

$$f(a, b, c, d) = \sum m(1, 3, 4, 5, 6, 7, 10, 12, 13) + \sum d(2, 9, 15)$$

4. Find a minimum 2-level NAND gate circuit to simultaneously realize

$$F_1(A, B, C, D) = \sum m(1, 3, 5, 7, 8, 9, 13)$$

$$F_2(A, B, C, D) = \sum m(1, 3, 5, 7, 8, 10, 13)$$

(Hint: Minimum solution has 6 gates)