King Fahd University of Petroleum & Minerals

College of Computer Sciences and Engineering

Department of Computer Engineering

COE 202: Fundamentals of Computer Engineering (071)

Assignment 2

1. Prove the identity of each of the following Boolean equations, using algebraic manipulation:

(a) Y + X'Z + XY' = X + Y + Z

(b) X'Y' + Y'Z + XZ + XY + YZ' = X'Y' + XZ + YZ'

2. Simplify the following Boolean expressions to expressions containing a minimum number of literals:

(a) A'C' + A'BC + B'C

(b) BC + B (AD + C'D)

3. Find the complement of the following expression:

(A + B' +C)(A'B' + C)(A + B'C')

4. Obtain the truth table of the following functions, and express each function in sum-of-minterms and product-of-maxterms form:

WXY' + WXZ' +WXZ+YZ'

5. Optimize the following expression in (1) sum-of-products and (2) product-of-sums forms:

(A' + B' + D)(A' + D')(A + B + D')(A + B' + C + D)

6. Optimize the following Boolean function F together with the don't-care condition d:

$F(W,X,Y,Z) = \Sigma m(0,6,8,13,14)$, $d(W,X,Y,Z) = \Sigma m(2,4,7,10,12)$