

HW3

1. (20%) Simplify the following Boolean functions or expression using map method:
 - (a) $F(w, x, y, z) = \Pi(1,3,5,8,9,11,13,15)$
 - (b) $G(a,b,c) = ac' + a'b'c + bc$

2. (20%) Simplify the following Boolean functions by first finding the essential prime implicants (Please indicate the essential prime implicants and prime implicants):
 - (a) $F(a, b, c) = \Sigma(0,1,3,4,7)$
 - (b) $F(w,x,y,z) = (x+y'z')(w+xy')$,

3. (20%) Simplify the following Boolean function F, together with the don't-care conditions d, and then express the simplified function in sum of products:
$$F(w, x, y, z) = \Pi(0,2,4,6,7,10,11,12,13,14), d = \Sigma(2,7,11,13)$$

4. (10%) Simplify the following expression, and implement it with two-level NAND gates:
$$F(A, B, C) = \Pi(2,5,6)$$

5. (10%) Simplify the following expression, and implement it with two-level NOR gates:
$$F(w, x, y, z) = \Sigma(1,3,5,8,9,11,13,15)$$

6. (20%) Simplify the following Boolean function F, using the two-level forms (a) AND-OR-Inverter, (b) OR-AND-Inverter logic diagrams
$$F(A, B, C) = \Sigma(0,2,4,5,6)$$