

디지털 공학 (MEC520)

Midterm Examination

Spring, 2008

1. Perform the following subtraction using the 2's complement after converting the decimal numbers to binary numbers. (10 pt)

$$36 - 63.6875$$

2. Reduce the following Boolean expression to the indicated number of literals. (10 pt each)

a) $(x'y' + z)' + z + xy + wz$ to three literals

b) $A'C' + ABC + A'C'$ to three literals

3. Simplify the following functions in sum of products, and especially for a) obtain all possible combinations of simple expressions. (15 pt each)

a) $F(w, x, y, z) = \Sigma(0, 2, 4, 5, 6, 7, 8, 10, 13, 15)$

b) $F(A, B, C, D, E) = \Sigma(0, 2, 4, 6, 9, 13, 21, 23, 25, 29, 31)$

4. Simplify the following Boolean Function F, together with the don't care conditions d, and then express the simplified function in product of maxterms. (15 pt each)

a) $F(A, B, C, D) = \Sigma(0, 6, 8, 13, 14)$

d) $d(A, B, C, D) = \Sigma(2, 4, 10)$

b) $F(A, B, C, D) = \Pi(1, 3, 5, 7, 9, 15)$

d) $d(A, B, C, D) = \Sigma(4, 6, 12, 13)$

5. Simplify the following Boolean Function F. (10 pt each)

$$F = xy'z' + x'yz' + xyz + x'y'z$$

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