CS M51A, Sec. 1, Class Exercises No. 5

Ex. 5.6 Using K-maps, find minimal sum of products and product of sums that are equivalent to the following expressions:

a) $E(w,x,y,z) = \prod M(1,3,4,7,10,13,14,15)$

b) $E(w,x,y,z) = \sum m(0,4,5,9,11,14,15)$, $dc(w,x,y,z) = \sum m(2,8)$

c) $E(x,y,z) = \sum m(0,1,4,6)$

Ex. 5.7 For $f(w,x,y,z) = \textit{one-set}(1,5,7,8,9,10,14)$:

a) Find all the prime implicates of f.

b) Indicate which of these prime implicates are essential.

c) Obtain a minimal product of sums for f. Is it unique?

For Exercises 5.8 - 5.17 assume that both input forms (uncomplemented and complemented) are available. Perform the following steps:

a) Obtain minimal expressions (sum of products and product of sums). Determine one minimal expression for each output.

b) Map each expression into a gate network.