

## ECE451 Homework #5

3.2: (Boolean Simplification) What are the prime implicants for each of the expressions below? Which are essential? Are any redundant?

- a.  $f(V,W,X,Y,Z) = \prod M(0,4,18,19,22,23,25,29)$
- b.  $f(A,B,C,D) = \sum m(0,1,4,5,12,13)$
- c.  $f(A,B,C,D,E) = \sum m(0,4,18,19,22,23,25,29)$
- d.  $f(A,B,C,D,E,F) = \sum m(3,7,12,14,15,19,23,27,28,29,31,35,39,44,45,46,48,49,50,52,53,55,56,57,59)$

3.6: (Quine-McCluskey Method) Use the Quine-McCluskey method to find the minimum sum-of-products form for the following Boolean expressions. Show your process of deriving the prime implicants. Include the implication chart from which your minimum sum-of-products form is derived.

- a.  $f(X,Y,Z) = \sum m(2,3,4,5)$
- b.  $f(A,B,C,D) = \sum m(1,5,7,8,9,13,15) + \sum d(4,12,14)$
- c.  $f(A,B,C,D) = \sum m(1,2,3,4,5,6,7,8,9,10,11,12)$
- d.  $f(A,B,C,D) = \sum m(1,2,3,4,9,10,11,12) + \sum d(0,13,14,15)$