Nick McCullough Lab7

CprE 281 QUIZ 6
ELECTRICAL AND COMPUTER ENGINEERING
IOWA STATE UNIVERSITY

Initial Stuff and Basics
Assigned Date: Week # 08

Instructions

Complete the question below to the best of your ability. Once complete, upload a PDF of your work to canvas.

Questions

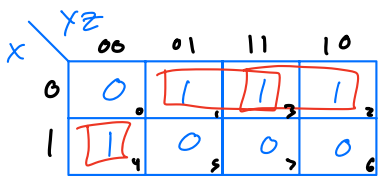
P1. Decoder Synthesis (2 x 25p each = 50p)

a) (25p) Draw the truth table for the function $\boldsymbol{f(X,Y,Z) = \bar{X}Y + \bar{X}Z + X\bar{Y}\bar{Z}}$

b) (25p) Implement **f** using one **3-to-8 decoder** and a minimal number of gates.

a)

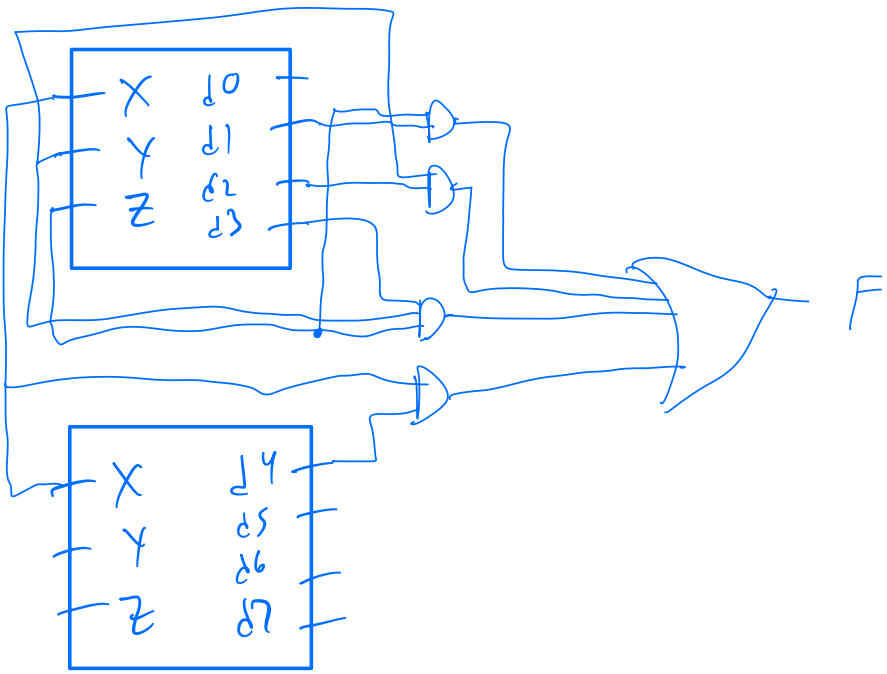
X	Y	Z	f
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	0



$\bar{X}Y + \bar{X}Z + X\bar{Y}\bar{Z}$

$f(X,Y,Z) = \Sigma m(1,2,3,4)$

b) implement f using 3 to 8 decoder + minimum gates



Z·d1 Y·d2 Y·Z·d3 X d4

f	inputs X	Y	Z	outputs d0	d1	d2	d3	d4	d5	d6	d7
0	0	0	0	1	0	0	0	0	0	0	0
1	0	0	1	0	1	0	0	0	0	0	0
1	0	1	0	0	0	1	0	0	0	0	0
1	0	1	1	0	0	0	1	0	0	0	0
1	1	0	0	0	0	0	0	1	0	0	0
0	1	0	1	0	0	0	0	0	1	0	0
0	1	1	0	0	0	0	0	0	0	1	0
0	1	1	1	0	0	0	0	0	0	0	1