

Boise State University
Department of Electrical and Computer Engineering
ECE 230 Digital Systems
Quiz 2– September 3, 2010

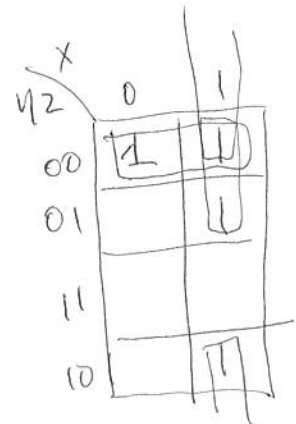
Name:

1. Complete the truth table using $f = \sum m(0, 4, 5, 6)$.

| x | y | z | f |
|-----|-----|-----|-----|
| 0 | 0 | 0 | 1 |
| 0 | 0 | 1 | 0 |
| 0 | 1 | 0 | 0 |
| 0 | 1 | 1 | 0 |
| 1 | 0 | 0 | 1 |
| 1 | 0 | 1 | 1 |
| 1 | 1 | 0 | 1 |
| 1 | 1 | 1 | 0 |

2. Use algebraic manipulation to find the minimum sum-of-products of f .

$$\begin{aligned}
 f &= \bar{x}\bar{y}\bar{z} + \bar{x}\bar{y}z + x\bar{y}\bar{z} + x\bar{y}z \\
 &= (\bar{x} + x)\bar{y}\bar{z} + x(\bar{y} + y)\bar{z} + x\bar{y}(\bar{z} + z) \\
 &= \bar{y}\bar{z} + x\bar{z} + x\bar{y}
 \end{aligned}$$



3. Implement f using NAND only gates.

