Boise State University
Department of Electrical and Computer Engineering
ECE 230 Digital Systems
Quiz 6 – October 8 2010

Name: Key

(4) 1. Convert decimal number 14.875_{10} to binary representation with 4-bit accuracy.

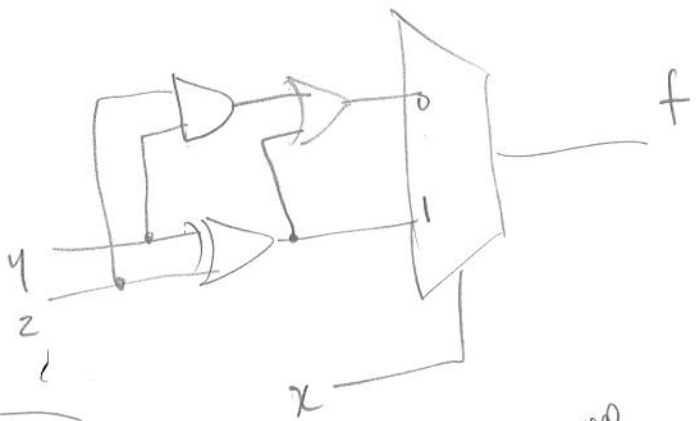
8 4 2 1 . 0.5 0.25 0.125 0.0625
1 1 1 0 . 1 1 1 0

1110.1110_2

(6) 2. Consider the function $f(x, y, z) = \sum m(1,2,3,5,6)$, *where x is the MSB and y and the LSB.* Use the true table to derive a circuit for f that uses a 2-to-1 multiplexer and some basic gates.

Note: Use Shannon's expansion, first variable to use is x, then y, then z.

$$f = \bar{x}\bar{y}z + \bar{x}y\bar{z} + \bar{x}yz + x\bar{y}z + xy\bar{z}$$
$$= \bar{x}(\bar{y}z + y\bar{z} + yz) + x(\bar{y}z + y\bar{z})$$



Note: $\bar{y}z + y\bar{z} + yz$

$= (\bar{y} + y)z + y(\bar{z} + z)$

$= z + y$

OR