Lab 5 – Two Input Gates

Names: Nathaniel Paulus, Austin Denney

Date: September 22, 2017

The purpose of this lab is to:

Learn how two input logic gates work using digital ICs, switches and resistors.

Select two 10kohm resistors.

Measure and record the resistance of each resistor.

Equipment needed:

1 – Digital Multimeter

2 – 10Kohm

1 – 4 position dip switch

1 – 74LS04 Hex Inverter

1 – 74LS08 Quad AND

1 – 74LS32 Quad OR

1 – 74LS86 Quad XOR

Using Multisim simulate Figure 1 for each input and record in Table 1. Then build and test and measure each voltage level and record in Table 1

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Simulated | | | | | Test | | | | |
| A = | 0 | 0 | 1 | 1 | A = | 0 | 0 | 1 | 1 |
| B = | 0 | 1 | 0 | 1 | B = | 0 | 1 | 0 | 1 |
| OR |  |  |  |  | OR |  |  |  |  |
| AND |  |  |  |  | AND |  |  |  |  |
| XOR |  |  |  |  | XOR |  |  |  |  |
| NOR |  |  |  |  | NOR |  |  |  |  |
| NAND |  |  |  |  | NAND |  |  |  |  |
| XNOR |  |  |  |  | XNOR |  |  |  |  |

Table 1 Simulation vs Test



Figure 1- Lab 5 Schematic

Observations: The pattern for the truth table of the first four gates is that all the outputs are the same except one. For the last two there are two and two. XOR effectively checks if the inputs are unequal, while XNOR checks that they are equal.