

# Experiment 10

## Digital Design

### Pre-Lab Report

#### Half Adder

From the table in Figure 3 we obtained:

$$\begin{aligned}S_1 &= \bar{A}_1 B_1 + A_1 \bar{B}_1 \\C_1 &= A_1 B_1\end{aligned}$$

In the laboratory session you will only be provided with a 74LS00 chip which is a quad two input NAND gate chip and a 74LS04 hex inverter chip. In order to be able to implement the design you need to convert the equations of  $S_1$  and  $C_1$  into an equivalent algebraic form that only uses NAND gates and inverters. Use demorgan's theorem to prove that

$$S_1 = \overline{\overline{A(\overline{AB})} \cdot \overline{B(\overline{AB})}}$$

