Lab Experiment #5

ECE 282 - 002

Friday PM Lab

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Laboratory Experiment #5 Pre-Lab

1. Review the data sheets for the two Flip-Flop ICs included in your parts kit: 74LS74A and 74LS76A and understand the functions of each. Compare the operation of both as described in the data sheets to the tables shown on pp.576-577.

2. Design the sequential circuit for the State Diagram shown in Fig.9.14 on p.578. Use D flip-flops for the circuit and provide the following: State Table K-Maps for the simplified state equations and output Complete Logic Diagram Also provide an electronic Circuit Schematic including part and pin numbers as well as power and ground connections. Laboratory

Experiment #5

1. Connect the 74LS76A JK Flip-Flop onto the digi-designer and ‘Verify the Function Table’ shown on p.576. Connect the JK inputs to switches and outputs Q and Q’ to LEDs. Do not leave the ‘Preset’ and “Clear’ inputs floating when not being used; connect them so that they are inactive. Demonstrate the operation to the TA. (If the 74LS76 is defective, perform the above with the 74LS74 D Flip-Flop)

Summary:

Since our parts kit did not have a 393 IC chip, we had to create a JK flip flop using AND gates. When we hooked up the various chips, we used the switches and the LED lights to determine our output. Everything worked perfectly in our first go.

2. Construct the circuit designed in part 2 of the Pre-Lab above for the ‘State Diagram’ on p.578. Connect the inputs to switches and the outputs to LEDs. Also, display both the inputs and outputs on the oscilloscope. Demonstrate the circuit’s operation to the TA and include the oscilloscope display in your Lab Report

Summary:

Using a D Flip Flop, we created the circuit based on the logic diagram in the book. We ran into some problems, but that was due to our circuit design. We ended up getting the correct output once we corrected the design. This one took a little longer due to many errors in our circuit and misinterpretation of data on the oscilloscope.