Part I:

- 1. Design a 2 input(2 to 1) MUX with inputs A, B; select signal S; and output Q.
- 2. Draw the truth table for your MUX.
- 3. Use a K-map, simplify and draw the resultant circuit.
- 4. Create a VHDL model of your testbench using simple gates.
- 5. Create a VHDL testbench to verify your truth table.
- 6. Demonstrate the simulation of your testbench to the TA.
- 7. Design a 4 to 1 MUX using your 2 to 1 MUXes.
- 8. Implement the 4 to 1 MUX in VHDL using your 2 to 1 MUXes.

Part II:

- 1. Download the DXCRP-demo.zip from the lab website.
- 2. Unpack the zip file and open Xilinx ISE.
- 3. Open the xcrpsimpledemo.npl within ISE.
- 4. Ensure that your are targeting the correct chip (XCR3064 CPLD).
- 5. Synthesize the design as we practiced in Lab 2. Take it all the way to "Generate Programming File".
- 6. Plug-in the XCRP board (both power and parallel port.)
- 7. Open the Impact tool (Expand the Generate Programming File Process) and program the board with the demo.
- 8. To program: use the default programming mode, open the .jed file, and then right click on the chip to get the programming option. You should be able to just use the defaults.
- 9. Demonstrate your programmed board to the TA.

Part III:

- 1. Next we are going to program the board to do what we want.
- 2. Using the XCRP reference manual determine how to encode "A", "b" and "E" on the seven segment display. Also add one more letter of your choice.

- 3. Design a circuit to take 4 different bit encodings and pass them out using your 4 to 1 MUX. Using the board, you will connect the slide switches to the inputs of your 4 to 1 MUX and the outputs will drive the seven segment displays. For now we will tie an(0) and an(1) to high and both displays will show the same number.
- 4. Draw your circuit including the slide switches, seven segment display and 4 to 1 MUX.
- 5. Take the DXCRP-demo.zip design and edit the xcrpdemo.vhd. Remove all of the unnecessary circuitry.
- 6. Write VHDL inserting your MUX and tie the inputs and outputs to the write place. Be sure not to leave any outputs floating.
- 7. Download your design onto the board.
- 8. Demonstrate the proper execution of your design on the board to the TA.