1. An older-model Thunderbird car has three left and three right tail lights, which flash in unique patterns to indicate left and right turns. For a left turn, the lights on the left side flash off off off, off off on, off on on, and on on on, in sequence. For a right turn, the lights on the right side flash off off off, on off off, on on off, and on on on, in sequence. Design a state machine in VHDL that controls some part of the 7 segment displays on the UP1 board to demonstrate these lights. Use switches or push buttons as appropriate for three inputs — left, right, and hazard. Left and right are from the driver’s turn signal, so can not be on at the same time. Hazard takes priority over all else, and causes all 6 lights to flash. Turn in:

a) a description of your design and any design decisions that you made in your implementation (30 points)

b) a readable (not microscopic) printout of the schematic (10 points)

c) a printout of the test inputs and simulation output that shows that the circuit works as expected, annotated to explain the operation of the circuit (30 points)

d) a signature on the statement below by Prof. Walker, by the TA (Kevin Schaffer), by one of Prof. Walker’s research students listed on the door of the lab, or by two other students in the class (30 points):

I certify that ____________________________________________ has successfully downloaded this design to a UP1 board and the design works correctly.

________________________________________ Name _______________ Date

________________________________________ Name _______________ Date