CSE140 Exercise 4 (No due date)

(I) (FSM Specification) Exercise 3.31: Analyze the circuit in Figure 3.72.
(a) Write the state transition table.
(b) Sketch the state diagram.
(c) Describe in words what the finite state machine does.

(II) (FSM Specification) Exercise 3.32: Analyze the circuit in Figure 3.73.
(a) Write the state transition table.
(b) Sketch the state diagram.
(c) Describe in words what the finite state machine does.

(III) (Sequential Network Design) Exercise 3.10: Draw the logic diagram to show your designs for the following problems.
(a) Construct a JK flip-flop using a D flip-flop and a minimal AND-OR-NOT network.
(b) Construct a D flip-flop using a JK flip-flop and a minimal AND-OR-NOT network.
(c) Construct a T flip-flop using a JK flip-flop and a minimal AND-OR-NOT network.

(IV) (Sequential Network Design) A state machine is described with the following state equations.
\[ Q_1(t+1) = Q_0(t) + Q'_1(t)x(t), \]
\[ Q_0(t+1) = Q_1(t) \oplus x(t) + Q_0(t)x(t), \]
\[ y(t) = Q'_1(t)Q_0(t) + x(t). \]
(a) Write the state table.
(b) Design the system with two T flip-flops and a minimal AND-OR-NOT network.
(c) Design the system with two SR flip-flops and a minimal AND-OR-NOT network.