Write separate Finite State Automaton to meet each of the following requirements. Each FSA inputs a series of 0’s and 1’s on each clock pulse. The output should be one if the input meets the requirements and zero otherwise.

1. Input that has exactly one zero.
2. Input that has at least one zero.
3. Input with no more than three zeroes.
4. Input with at least one zero and exactly two ones.
5. Input that contains “010” at least once.
6. Input that repeats “01” forever.

Show how to implement any two of the above FSA using flip-flops. For each FSA that you implement, give a truth table showing the current state, the input, the next state and the output. Draw a logic circuit diagram of the implementation using flip-flops (any kind) and other logic elements such as AND, OR and NOT gates.