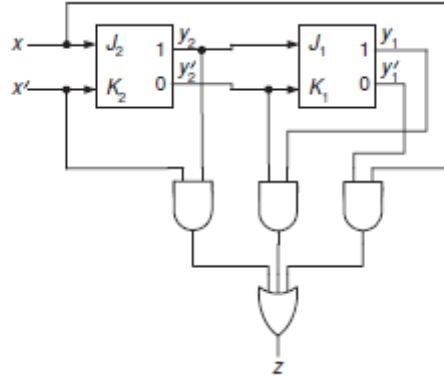


Problem Set 2

Q1. For the circuit given below :

- (a) Write down the excitation and output function
- (b) Form the excitation and state tables



Q2. Gray codes have the useful property that consecutive numbers differ in only a single bit position. Design a 3-bit Gray code counter FSM with no inputs and three outputs. When reset, the output should be 000. On each clock edge, the output should advance to the next Gray code. After reaching 100, it should repeat with 000. Draw a schematic for this counter using T flip- flops.

Q3. Design a counter with the following repeated binary sequence: 0, 4, 2, 1, 6. Draw a schematic for this counter using T flip- flops.

Q4. A long input sequence enters a one-input one-output synchronous sequential circuit, that is required to produce an output symbol $z = 1$ whenever the sequence 1111 occurs. Overlapping sequences are accepted; for example, if the input sequence is 01011111....., the required output sequence is 00000011.....

- (a) Draw a state diagram.
- (b) Select an assignment and show the excitation and output tables.
- (c) Write down the excitation functions for SR flip-flops, and draw the corresponding logic diagram.